

122 4492
LIBRARY
FISH & WILDLIFE SERVICE
PACIFIC OCEANIC FISHERY
INVESTIGATIONS

Publications of the Carnegie Museum, Serial No. 115

MEMOIRS
OF THE
CARNEGIE MUSEUM

VOL. X

No. 1

W. J. HOLLAND, EDITOR

A LIST OF THE FISHES OF HAWAII, WITH NOTES AND
DESCRIPTIONS OF NEW SPECIES

BY

DAVID STARR JORDAN AND ERIC KNIGHT JORDAN

PITTSBURGH

PUBLISHED BY THE AUTHORITY OF THE BOARD OF TRUSTEES OF THE
CARNEGIE INSTITUTE

DECEMBER, 1922

LIBRARY
Pacific Islands Fisheries Science Center
NOAA Fisheries
Honolulu, Hawaii

QL
623.4
.J6
1922

PRICE LIST OF PUBLICATIONS OF THE CARNEGIE MUSEUM

ANNUAL REPORTS OF THE DIRECTOR

1898, 80c. (scarce); 1899, 25c.; 1900, 30c. (scarce); 1901-22, 25c. each.

REPORTS OF PROCEEDINGS OF FOUNDER'S DAY

1898-1922, 35c. each.

ANNALS OF THE CARNEGIE MUSEUM

The Annals are supplied to those who subscribe in advance in parts (paper-bound), as published, @ \$3.50 per volume; Vols. I-XIV, 1901-1922, bound in green cloth @ \$4.00; bound in $\frac{1}{2}$ Morocco @ \$4.50.

MEMOIRS OF THE CARNEGIE MUSEUM

The Memoirs are supplied to those who subscribe in advance in parts (paper-bound), as published, at \$10 per volume; bound in green buckram at \$10.75, and in half-morocco at \$12.00.

VOL. I. (1901-3)

- | | |
|---|--|
| No. 1. <i>Diplodocus</i> , Its Osteology, Taxonomy, etc.
HATCHER | No. 3. Osteology of the Steganopodes. SHUFFELDT \$2.75 |
| " 2. <i>Oligocene Canida</i> . HATCHER | " 4. Classification of Chalcid Flies. ASHMEAD.. 6.50 |
| | |

VOL. II. (1904-6)

- | | |
|---|--|
| No. 1. Osteology of <i>Haplocanthosaurus</i> , etc. HATCHER \$2.00 | " 6. Osteology of <i>Diplodocus</i> . HOLLAND 1.50 |
| " 2. Osteology of <i>Baptanodon</i> . GILMORE 1.50 | " 7. Osteology of <i>Protostega</i> . WIELAND 75 |
| " 3. Fossil Avian Remains from Armissan. EASTMAN 1.00 | " 8. New Suilline Remains from the Miocene of Nebraska. PETERSON 75 |
| " 4. New Rodents and Discussion of Origin of <i>Dæmonelix</i> . PETERSON 1.75 | " 9. Notes on the Osteology of <i>Baptanodon</i> , etc. GILMORE 1.00 |
| No. 5. Tertiary of Montana. DOUGLASS \$1.00 | " 10. The Crawfishes of Pennsylvania. ORTMANN 4.00 |

VOL. III.

- | | |
|---|---|
| No. 1. Archaeological Investigations in Costa Rica. HARTMAN | No. 2. Osteology of <i>Moropus</i> . HOLLAND and PETERSON |
| | |

VOL. IV.

- | | |
|--|--|
| No. 1. Early Chinese Writing. CHALFANT \$3.00 | No. 5. New Carnivores from the Miocene of Western Nebraska. PETERSON \$1.50 |
| " 2. Formosan Fishes. JORDAN 25 | " 6. Monograph of the Najades of Pennsylvania. Pts. I and II. ORTMANN. 2.50 |
| " 3. <i>Entelodontida</i> . PETERSON 2.50 | " 7. Catalog Eocene Fishes from Monte Bolca in Carnegie Museum. EASTMAN 3.00 |
| " 4. Fishes of Formosa. JORDAN and RICHARDSON 1.25 | |

VOL. V.

The Fresh Water Fishes of British Guiana. EIGENMANN. \$10 unbound; \$10.75 cloth; \$12.00 $\frac{1}{2}$ morocco.

VOL. VI.

- | | |
|--|---|
| No. 1. Fishes from Korea. JORDAN and METZ \$1.50 | No. 4. Fishes obtained in Japan. 1911. JORDAN and THOMPSON \$3.50 |
| " 2. Lantern-fishes of Japan. GILBERT 1.00 | Nos. 5-7. Fossil Fishes in the Carnegie Museum. Parts II-IV. EASTMAN 5.00 |
| " 3. Gymnotid Eels of Tropical America. MAX MAPES ELLIS. 1.50 | |

VII.

- | | |
|---|---|
| No. 1. The Cheirodontinae. EIGENMANN \$3.50 | No. 4. <i>Pimelodella</i> and <i>Typhlobagrus</i> . EIGENMANN. 2.00 |
| " 2. Turtles of Uinta Formation. GILMORE 2.00 | No. 5. The Pygididae. EIGENMANN 2.50 |
| No. 3. <i>Ophidia</i> from S. America. GRIFFIN 2.00 | No. 6. American <i>Diceratheres</i> . PETERSON 2.25 |

VIII.

- | | |
|--|---|
| No. 1. Monograph of the Naiades of Pennsylvania. Part III. ORTMANN | No. 2. Fossil Plants from Montana. JENNINGS... \$3.50 |
| | No. 3. South American Naiades. ORTMANN..... 5.00 |

IX

- | | |
|---|--|
| No. 1. The Fishes of Western South America. Part I. EIGENMANN | No. 2. Neotropical Tingitidae. DRAKE..... 2.00 |
| | |

X

- | | |
|---|------|
| No. 1. A List of the Fishes of Hawaii, with Description of New Species..... | 4.00 |
|---|------|

REPRINTS FROM THE ANNALS OF THE CARNEGIE MUSEUM

Nos. 1-59. See preceding lists. (Mostly out of print.)

PIFSC LIBRARY



0000000007028

Ref. Shelf
QL 623.4
J

232⁶⁰

MEMOIRS

OF THE

CARNEGIE MUSEUM

VOL. X.

No. 1.

A LIST OF THE FISHES OF HAWAII, WITH NOTES AND DESCRIPTIONS OF NEW SPECIES.

BY DAVID STARR JORDAN AND ERIC KNIGHT JORDAN.

(PLATES I-IV).

The senior author of this paper spent most of the month of August, 1921, at Honolulu in attendance upon the Pan-Pacific Educational Conference. While there, he gave all available time to making collections of fishes, having the efficient assistance of Mr. Fordyce Grinnell, Jr., a former student of his, who visited the markets daily. The collections made have been distributed among a number of museums. The *Carangidae* have been sent to the American Museum of Natural History in New York to be used in a monograph of that group by Mr. John Treadwell Nichols; the types of new species have been sent to the Carnegie Museum in Pittsburgh; and series of other species, more or less complete, to the American Museum of Natural History, the Carnegie Museum, the Southwestern Museum at Los Angeles, and to the Universities of Michigan and of Iowa.

In addition to notes on new and rare forms we have given a complete list of the species thus far known from Hawaii, the whole serving as a revision of the two memoirs on the Aquatic Resources of the Hawaiian Islands, published by the United States Fish Commission in 1905, the first by David Starr Jordan and Barton Warren Evermann on the survey of the shore-fishes made in 1901;* the other by Charles Henry Gilbert on the deep-sea forms taken by the "Albatross" in 1902.†

* Bull. U. S. Fish Comm., 1903 (1905), Vol. XXIII, Pt. I, pp. 1-574.

† *Ibidem*, Pt. II, pp. 575-713.

In the memoir by Jordan and Evermann will be found an account of the earlier explorations of the islands, as well as a detailed statement of the character of the fish-fauna and its relation to that of the South Seas.

Descriptions of species, notes on habits, and references to synonymy, where accurately given by Jordan and Evermann or by Gilbert, are in general not repeated in the following paper. The student who is using the present list is presumed to have the other two lists at hand, and references to their pages are given throughout this list.

The principal articles upon the Hawaiian fish-fauna, published since the two above-named papers appeared, are the following:

1. Jordan (David Starr) and Seale (Alvin)—"*The Fishes of Samoa, with a Checklist of the Fishes of Oceania*," published by the United States Bureau of Fisheries, 1906.
2. Bryan (William Alanson)—"*Three New Hawaiian Fishes*." Occasional Papers of the Bernice Pauahi Bishop Museum, II, 1906.
3. Jordan and Snyder (John Otterbein)—"*Notes on Fishes of Hawaii, with Descriptions of New Species*." Bulletin of the United States Bureau of Fisheries for 1906 (1907).
4. Gilbert (Charles Henry)—"*The Lantern-fishes*." Memoirs Museum Comparative Zoölogy, XXVI, 1908.
5. Jordan and Dickerson (Mary Cynthia)—"*On a Collection of Fishes from Fiji, with Notes on Certain Hawaiian Fishes*." Proceedings U. S. National Museum, XXXIV, 1908.
6. Jordan and Metz (Charles William)—"*Descriptions of Two New Species of Fishes from Honolulu, Hawaii*." Proceedings U. S. National Museum, XLII, 1912.
7. Jordan (David Starr)—"*Description of Deep-sea Fishes from the Coast of Hawaii Killed by a Lava-flow from Mauna Loa*." Proceedings U. S. National Museum, LIX, 1921.

THE FISHES OF HAWAII.

Class LEPTOCARDII.

Order CIRROSTOMI.

Family I. BRANCHIOSTOMIDÆ (The Lancelets).

AMPHIOXIDES Gill.

1. *Amphioxides pelagicus* (Günther). (J. & E., p. 33.)

Pelagic. This diminutive lancelet, supposed to be distinguished by the absence of buccal cirri and by its pelagic habit, is now regarded as a larval form. The supposed genus is nearer *Branchiostoma* than *Epigonichthys* (*Asymmetron*), the only other genus of this family as yet found in the open Pacific.

Class ELASMOBRANCHII.

Order ASTEROSPONDYLI.

Family II. SCYLLIORHINIDÆ.

APRISTURUS Garman.

2. *Apristurus spongiceps* (Gilbert). (Gilbert, p. 579.)

Deep seas. This species is referred by Garman to *Pristiurus*, which genus is characterized by a row of prickly scutes along the upper side of the tail. These are not present in Gilbert's type, though perhaps they may have been lost in the dredge. A cast in the Bishop Museum may belong to this species. Color plain light brown; dorsal fins small, subequal, the first slightly in advance of ventrals. The name *Catulus* is preoccupied in the *Insecta*.

Family III. GALEORHINIDÆ.

(*Carcharhinidæ* of authors.)

GALEORHINUS Blainville.

(*Eugaleus* Gill.)

Amid the uncertainties regarding the application of the generic names *Galeus* Rafinesque and *Carcharias* Cuvier, we here follow the decision of the International Commission of Nomenclature.

3. *Galeorhinus japonicus* (Müller and Henle). (J. & E., p. 36.)

Recorded from Laysan by Steindachner. Not rare in Japan.

GALEOCERDO Müller and Henle.

4. *Galeocerdo tigrinus* Müller and Henle. (J. & E., p. 36.)

Rare. Taken once in Honolulu.

PRIONACE Cantor.

(*Prionodon* Müller and Henle, preoccupied; *Cynocephalus* (Klein) Gill.)

5. *Prionace glauca* (Linnæus). (J. & E., p. 37.)

Occasional in Japan. A cast in the Bishop Museum shows the pectoral fin rather longer than in the Atlantic *P. glauca*. A specimen taken by the "Albatross" agrees with this, the pectoral being 4.5 in total length, instead of 6.25.

CARCHARINUS Blainville.

(*Eulamia* Gill.)

6. *Carcharinus melanopterus* (Quoy and Gaimard). *Mano*. (J. & E., p. 38.)

A fine cast of this common species is in the Bishop Museum.

7. *Carcharinus phorcys* (Jordan and Evermann). (J. & E., p. 39.)

Occasional about Hawaii.

8. *Carcharinus insularum* (Snyder). (J. & E., p. 40.)

Rather rare.

9. *Carcharinus nesiotes* (Snyder). (J. & E., p. 40.)

Common about Hawaii.

Family IV. SPHYRNIDÆ (Hammer-head Sharks).

SPHYRNA Rafinesque.

10. *Sphyrna zygaena* (Linnæus). *Mano kihikihi*. (J. & E., p. 41.)

The common "Hammer-head" needs comparison with its fellows in the Atlantic.

Family V. ALOPIIDÆ (Thresher-sharks).

ALOPIAS Rafinesque.

11. *Alopias vulpes* (Gmelin). (J. & E., p. 42.)

Not common.

Family VI. LAMNIDÆ (Mackerel-sharks).

ISUOPSIS Gill.

12. *Isuopsis glauca* (Müller and Henle). (J. & E., p. 43.)

Not rare. This shark, with others, needs comparison with Atlantic representatives.

CARCHARODON Müller and Henle (Man-eaters, or Great White Sharks).

13. **Carcharodon carcharias** (Linnæus). *Niihi*.

Probably not rare.

Family VII. SQUALIDÆ (Dog-fishes).

SQUALUS Linnæus.

(*Acanthias* Risso.)

14. **Squalus mitsukurii** Jordan and Snyder. (J. & E., p. 45; G., p. 580.)

Not rare. A common Japanese species.

ETMOPTERUS Rafinesque.

(*Spinax* Cuvier.)

15. **Etmopterus villosus** Gilbert. (G., p. 580.)

Deep seas. Taken off Molokai by the "Albatross."

CENTROSCYLLIUM Müller and Henle.

16. **Centroscyllium ruscsum** Gilbert. (G., p. 580.)

Deep seas. Taken off Kauai by the "Albatross"; identified by Garman with *C. nigrum* Garman from off the Galapagos.

Order BATOIDEI.

Family VIII. DASYATIDÆ (Sting-rays).

DASYATIS Rafinesque.

(*Trygon* Adamson; *Dasibatus* Garman, corrected spelling.)

17. **Dasyatis sciera** Jenkins. (J. & E., p. 47.)

Rather common at Honolulu.

18. **Dasyatis lata** (Garman). (J. & E., p. 47.)

One specimen known.

19. **Dasyatis hawaiiensis** Jenkins. (J. & E., p. 48.)

Only the type known.

Family IX. MYLIOBATIDÆ.

ÆTOBATUS Blainville, as revised by Müller and Henle.

(*Stoasodon* Cantor; *Goniobatis* Agassiz.)

20. **Ætobatus narinari** (Euphrasen) *Hihimānu*. (J. & E., p. 49.)

This species, rather common in Hawaii, seems indistinguishable from the Atlantic form.

Family X. MOBULIDÆ (Devil-rays).

MOBULA Rafinesque.

(*Cephalopterus* Duméril, name preoccupied.)

- 21.
- Mobula japonica*
- (Müller and Henle). (J. & E., p. 50.)

Class HOLOCEPHALI.

Order CHIMÆROIDEI.

Family XI. CHIMÆRIDÆ.

CHIMÆRA Linnæus.

- 22.
- Chimæra purpurescens*
- Gilbert. (G., p. 582.)

Deep seas. Dredged off Kauai.

Class PISCES.

Order ISOSPONDYLI.

Family XII. ELOPIDÆ (Ten-pounders).

ELOPS Linnæus.

- 23.
- Elops hawaiiensis*
- Regan.
- Awa*
- . (J. & E., p. 53.)

Regan has shown that *Elops saurus* Linnæus, the common "Tenpounder" of the western Atlantic, is not really cosmopolitan, as supposed, but must be separated into several closely related species, of which the abundant Hawaiian form is one.

Family XIII. ALBULIDÆ (Lady-fishes).

ALBULA (Gronow) Scopoli.

(*Butyrinus* Lacépède.)

- 24.
- Albula virgata*
- sp. nov. Jordan and Jordan.
- Oio*
- . (J. & E., p. 55.) (Pl. I, fig. 1.)

Type No. 3896, Carnegie Museum, from Honolulu. 15.75 inches long.

The common *Oio* of the markets of Hawaii differs markedly in color from *Albula vulpes* of the American coasts, as well as from all of the nominal species of the genus hitherto described. All of these are brilliantly silvery, with only vague dark lines or stripes. The Hawaiian fish is dusky, marked with distinct stripes much like the markings on a Striped Mullet (*Mugil Cephalus*).

Head 3.33 in length; depth 4.33; dorsal rays 16; anal rays 8; scales 9-72-7; body elongate, moderately compressed; upper lobe of caudal somewhat the longer;

a broad band of elongate, membranaceous scales along middle line of back; accessory ventral scale large.

Color dusky olive, silvery below; a series of dark stripes extending lengthwise of the body, these mainly between the rows of scales, those below the lateral line fainter; dark lines above lateral line; below the lateral line the stripes composed of stippings of black dots; tip of snout black in color, forming a broken ring; a little black around nostrils; some faint dark blotches on head; all the fins finely dotted; dorsal and caudal narrowly rimmed with black.

Very common about Honolulu and Hilo, mostly inside the reefs.

The genus *Albula* is widely distributed in most warm seas, only the Mediterranean being excepted. Valenciennes recognizes several distinct species, but all recent writers have regarded all the forms as belonging to one species, no tangible differences in form, scales, or fins being evident. However, specimens from both coasts of America are brilliantly silvery without dark spots, and all the nominal species from the Red Sea, the East Indies, and the South Seas are also described as bright silvery. On the contrary all Hawaiian examples are dusky, with strong stripes along the sides.

Family XIV. CHANIDÆ.

CHANOS Lacépède.

25. *Chanos chanos* (Forskål). *Awa-awa*, *Awa kalamoku*, *Puawa*. (J. & E., p. 56.)

Valenciennes has indicated this common Hawaiian species under the name *Chanos cyprinella*, but we know of no characters to separate it from *C. chanos* of the Red Sea.

Family XV. DUSSUMIERIIDÆ (Round Herrings).

ETRUMEUS Bleeker.

26. *Etrumeus micropus* (Temminck and Schlegel). *Makiawa*. (J. & E., p. 58.)

We have been unable to separate this species, which is not very common in Hawaii, from its fellow in Japan. The Californian species, *Etrumeus othonops* (R. S. Eigenmann), taken but once, and referred to a different genus, *Perkinsia*, may be different. It is a singular fact that none of the true herrings, *Clupeidæ*, occur about Hawaii.

Family XVI. ENGRAULIDÆ (Anchovies).

STOLEPHORUS Lacépède.

(Anchoviella Fowler.)

I have given elsewhere ("Genera of Fishes," p. 169) my reason for following Bleeker in the application of the name *Stolephorus* to an Anchovy (*Anchoviella*) rather than to a Round Herring (*Spratelloides*). The genus *Anchovia* Jordan and Evermann is distinct from *Stolephorus*, which includes most of the tropical anchovies.

27. *Stolephorus purpureus* Fowler. *Nehu*. (J. & E., p. 60.)

A common little fish used as bait.

Family XVII. STOMATIDÆ.

LEPTOSTOMIAS Gilbert.

28. *Leptostomias macronema* Gilbert. (G., p. 607.)

Deep sea, off Niihau.

Family XVIII. ASTRONESTHIDÆ.

ASTRONESTHES Richardson.

29. *Astronesthes lucifer* Gilbert. (G., p. 605.)

Deep sea off Kauai.

Family XIX. GONOSTOMIDÆ.

CYCLOTHONE Goode and Bean.

30. *Cyclothone rhodadenia* Gilbert. (G., p. 602.)

Deep sea, Kaiwi Channel.

31. *Cyclothone canina* Gilbert. (G., p. 604.)

Deep sea off Kauai.

32. *Cyclothone atraria* Gilbert. (G., p. 605.)

Deep sea off Kauai.

Family XX. MAUROLICIDÆ.

ARGYRIPNUS Gilbert and Cramer.

33. *Argyripnus ephippiatus* Gilbert and Cramer. (G., p. 601.)

VINCIGUERRIA Jordan and Evermann.

(*Zalarges* Jordan and Williams, Proc. Cal. Ac. Sci., 1895, p. 793.)

34. *Vinciguerria nimbaria* (Jordan and Williams).
Pelagic. Northeast of Hawaii.

Family XXI. STERNOPTYCHIDÆ.

STERNOPTIX¹ Hermann.

35. *Sternoptix diaphana* Hermann. (G., p. 609.)
Deep seas. Widely distributed.

POLYIPNUS Günther.

36. *Polyipnus nuttingi* Gilbert. (G., p. 609.)
Deep sea.

ARGYROPELECUS Cocco.

37. *Argyropelecus heathi* Gilbert. (G., p. 601.)
Deep sea. Kauai Channel.

DIPLOPHOS Günther.

38. *Diplophos pacificus* Günther.
Deep sea, mid Pacific.

Family XXII. HALOSAURIDÆ.

ALDROVANDIA² Goode and Bean. (1895.)

(*Halosauropsis* Collett, 1896.)

39. *Aldrovandia kauaiensis* Gilbert. (G., p. 611.)
Deep sea off Kauai.
40. *Aldrovandia verticalis* Gilbert. (G., p. 611.)
Deep sea off Kauai.
41. *Aldrovandia proboscidea* Gilbert. (G., p. 612.)
Oahu and Molokai.

Family XXIII. SYNODONTIDÆ (Lizard-fishes).

TRACHINOCEPHALUS Gill.

42. *Trachinocephalus limbatus* Eydoux and Souleyet. *Kawelea*, *Welea*. (J. & E., p. 62.)
This fish, generally common in the Pacific, requires to be compared with *Trachinocephalus myops* of the Atlantic.

¹ Usually corrected to *Sternoptyx*.

² The name *Aldrovandia* apparently has priority over *Halosauropsis*.

SYNODUS (Gronow) Scopoli.

(Saurus Cuvier.)

43. *Synodus varius* (Lacépède). *Ulaë*. (J. & E., p. 63.)
Very common in shallow water. The color is very variable.
44. *Synodus kaianus* (Günther). (G., p. 588.)
Deep sea. Taken by the "Albatross" off Maui.

SAURIDA Cuvier and Valenciennes.

45. *Saurida gracilis* (Quoy and Gaimard). *Ulaë*. (J. & E., p. 65; G., p. 589.)
Common over coral sand.

Family XXIV. CHLOROPHTHALMIDÆ.

CHLOROPHTHALMUS Bonaparte.

46. *Chlorophthalmus proridens* Gilbert and Cramer. (J. & E., p. 66; G., p. 589.)
Deep sea. Common.

Family XXV. BATHYPTEROIDÆ.

BATHYPTEROIS Günther.

47. *Bathypterois antennatus* Gilbert. (G., p. 590.)
Taken by the "Albatross" off Kauai.

Family XXVI. PARALEPIDIDÆ.

LESTIDIUM Gilbert.

48. *Lestidium nudum* Gilbert. (G., p. 607.)
Deep sea, off Molokai.

Family XXVII. MYCTOPHIDÆ.

NEOSCOPELUS Johnson.

49. *Neoscopelus macrolepidotus* Johnson. (G., p. 601.)
Neoscopelus alcocki Jordan and Starks.
Pelagic, widely distributed. According to Gilbert Japanese and Hawaiian specimens are wholly identical with the original Atlantic form, *Neoscopelus macrolepidotus* Johnson, from Madeira.

DASYSCOPELUS Günther.

50. *Dasyscopelus pristilepis* Gilbert and Cramer. (G., p. 600.)
Pelagic, Hawaii to Marquesas.

51. *Dasyscopelus spinosus* (Steindachner). (G., p. 599.)
Pelagic, Hawaii and southeast.

RHINOSCOPELUS Lütken:

52. *Rhinoscopelus tenuiculus* Garman.
Pelagic, open seas, southeast of Hawaii.

MYCTOPHUM Rafinesque.

53. *Myctophum fibulatum* Gilbert and Cramer. (G., p. 596.)
Pelagic, Pailolo Channel between Maui and Molokai.
54. *Myctophum affine* (Lütken). (G., p. 596.)
Myctophum nitidulum Garman.
Myctophum margaritatum Gilbert.
Rhinoscopelus oceanicus Jordan and Evermann.
Pelagic, widely diffused.
55. *Myctophum evermanni* Gilbert. (G., p. 597.)
Pelagic, Hawaii to Marquesas.
56. *Myctophum reinhardti* Brauer. (G., p. 598.)
Myctophum braueri Gilbert, *non* Lönnberg.
Myctophum luetkeni Gilbert (on plate).
Pelagic, widely diffused throughout the tropics.
57. *Myctophum hollandi* sp. nov. Jordan and Jordan. (Pl. I, fig. 2.)
Type No. 3897, Carnegie Museum. From Honolulu.
Head 3.33 in length; depth 4.25; eye 3 in head; snout 6; maxillary 1.5; dorsal rays 1.12; anal rays 1.17; scales 3-35-5; thirty-four photophores on each side. Body moderately elongate, deepest at the occiput, as usual in this group; eye very large; snout very short; mouth large, oblique; jaws even; maxillary rather broad, extending beyond eye nearly to margin of preopercle. Scales rather large; lateral line well developed.
Photophores not divided by cross-line; using the nomenclature of Brauer's *Tiefseefische*, p. 155, they are arranged as follows:
Pectoral photophores (*maculae pectorales* PO) five, four in a continuous series, the last one higher; *Suprapectores* (PLO) one, close to gill-opening and to lateral line; *Subpectores* (PVO) two, one near lower axil of pectoral, the other a little lower, near gill-opening; *Ventrales* (VO) three, in a right line between ventrals and vent; *Anales* (AO) six, six in a right line with a vacant space equal to one spot above last rays of anal; *Posterolaterales* (Pol) one, just below lateral line and over

space in anal series; *Precaudales* (Prē) one, close to lateral line on level of postero-lateral spot; *Supra-anales* (SAO) three, the upper close to lateral line, the two below out of line, a very obtuse angle at the middle one; *Supraventral* (VLO) wanting; *Opercular* (OP) two, close on edge of preopercle, both below upper base of pectoral; *Mandibular* (Brr) three, in a right line; *Antorbital* (Antorb.) none, no suborbital or postorbital spots.

Dorsal fin high, its first ray equal to depth of body below it; adipose fin small; caudal deeply forked, its lobes 1.4 in head; anal fin rather long, falcate, its edge concave, its longest ray five-sixths height of dorsal, 1.8 in head; pectorals very long, reaching anal, as long as head; ventrals inserted just before dorsal, 2.4 in head.

Color blackish, paler below the luminous spots ringed with black.

A single example, 4.25 inches in length, was found in good condition by Mr. Grinnell in the market at Honolulu, perhaps a spewing from some large fish.

The species is related to *Myctophum braueri* as described by Gilbert (*Myctophum reinhardti* Lütken) but has the anal shorter and the anal photophores fewer.

According to Gilbert (*The Lantern-fishes*, Mem. Mus. Comp. Zoöl., XXVI, 1908, p. 219), *Myctophum reinhardti* Lütken is based on two examples. The one figured by Lütken with fourteen dorsal rays and twenty-four anal rays is regarded as the type. This is from the tropical Atlantic. Gilbert observes: "Lütken's fin-counts were taken from the second specimen, which belongs to a species which remains undescribed." It is very likely identical with *M. hollandi*.

CENTROBRANCHUS Fowler.

58. *Centrobranchus chærocephalus* Fowler. (G., p. 594.)

Pelagic, widely distributed.

59. *Centrobranchus gracilicaudus* Gilbert. (G., p. 595.)

Pelagic, off Niihau.

DIAPHUS Eigenmann and Eigenmann.

60. *Diaphus urolampus* Gilbert and Cramer. (G., p. 591.)

Pelagic, off Kauai.

61. *Diaphus chrysorhynchus* Gilbert and Cramer. (G., p. 592.)

Pelagic, off Oahu and Molokai.

62. *Diaphus adenomus* Gilbert. (G., p. 592.)

Pelagic, Kaiwi Channel.

LAMPANYCTUS Bonaparte.

63. *Lampanyctus omostigma* Gilbert.

Pelagic, southeast of Hawaii.

NANNOBRACHIUM Günther.

This genus is closely allied to *Lampanyctus* Bonaparte, *Nyctimaster* being distinguished by not having enlarged scales along the lateral line. It is distinguished from *Nannobrachium* by the very small pectorals of the latter.

64. *Nannobrachium nigrum* Günther. (G., p. 591.)

Pelagic, south to the Philippines.

65. *Nyctimaster reinhardti* Jordan.

(Cf. Proc. U. S. N. M., LIX, 1921, p. 645, fig. 2.)

The three known specimens of this species were killed in a lava-flow from Mauna Loa into deep water off the southwestern coast of Hawaii.

Order APODES (Eels).

Family XXVIII. SYNAPHOBANCHIDÆ.

SYNAPHOBANCHUS Johnson.

66. *Synaphobranchus brachysomus* Gilbert. (G., p. 583.)

Deep sea.

Family XXIX. LEPTOCEPHALIDÆ.

(*Congridæ*.)

LEPTOCEPHALUS (Gronow) Scopoli.

(*Conger* Cuvier, adult form.)

67. *Leptocephalus marginatus* (Valenciennes). *Puhi úha*. (J. & E., p. 76.)

Common in crevices of lava-rock.

68. *Leptocephalus bowersi* (Jenkins). (J. & E., p. 77.)

Rather common. This species belongs to the subgenus *Ariosoma* Swainson (*Congrellus* Ogilby) characterized by the feebler organization and the rather more advanced dorsal fin inserted over the gill-opening. As in *Leptocephalus* (*sens. str.*), the teeth are all sharp.

69. *Leptocephalus æquoreus* (Gilbert and Cramer). (G., p. 589; J. & E., p. 77.)

Deep sea.

VETERNIO Snyder.

70. *Veternio verrens* Snyder. (J. & E., p. 79.)

One large example from Honolulu.

PROMYLLANTOR Alcock.

71. *Promyllantor alcocki* Gilbert and Cramer. (G., p. 584.)

Deep sea.

Family XXX. MURÆNESOCIDÆ.

RHECHIAS Jordan.

72. *Rhechias armiger* Jordan.

(Cf. Jordan, Proc. U. S. N. M., LIX, 1921, p. 644, fig. 1.)

Off the southwestern coast of Hawaii, the type killed in deep water by a lava-flow from Mauna Loa.

Family XXXI. NETTASTOMIDÆ (Sorcerers).

METOPOMYCTER Gilbert.

73. *Metopomycter denticulatus* Gilbert. (G., p. 585.)

Deep sea, off Kauai.

Family XXXII. NEMICHTHYIDÆ (Snipe-eels).

NEMATOPRORA Gilbert.

74. *Nematoprora polygonifera* Gilbert. (G., p. 587.)

Deep sea, off Bird Island.

SERRIVOMER Gill and Ryder.

75. *Serrivomer beani* Gill and Ryder. (G., p. 586.)

Deep sea.

STEMONIDIUM Gilbert.

76. *Stemonidium hypomelas* Gilbert. (G., p. 586.)

Deep sea, off Niihau.

Family XXXIII. OPHICHTHYIDÆ (Snake-eels).

SPHAGEBRANCHUS Bloch.

77. *Sphagebranchus flavicaudus* Snyder. (J. & E., p. 80; G., p. 588.)

Occasionally taken.

LEIURANUS Bleeker.

(Stethopterus Bleeker has line-priority, but later *Leiuranus* was preferred by the author.)78. *Leiuranus semicinctus* (Lay and Bennett). (J. & E., p. 81.)

Warm parts of the Pacific. Rare about Hawaii.

MICRODONOPHIS Kaup.

79. *Microdonophis fowleri* Jordan and Evermann. (J. & E., p. 82.)

Rare, but three specimens known.

JENKINSIELLA Jordan and Evermann.

80. *Jenkinsiella macgregori* (Jenkins). (J. & E., p. 82.)
One specimen from Maui.

BRACHYSOMOPHIS Kaup.

81. *Brachysomophis henshawi* Jordan and Snyder. (J. & E., p. 83.)
One large specimen from Honolulu.

MYRICHTHYS Girard.

82. *Myrichthys stypurus* (Smith and Swain). (J. & E., p. 84.)
Johnston Island, one example known.
83. *Myrichthys magnificus* (Abbott). (J. & E., p. 84.)
Not seen since the original description was written.

CALLECHELYS Kaup.

84. *Callechelys luteus* Snyder. (J. & E., p. 86.)
One large example from Molokai.

Family XXXIV. MORINGUIDÆ.

MORINGUA Gray.

(*Raitaboura* Gray has line-priority, but *Moringua* has been preferred by revisers).

85. *Moringua hawaiiensis* Snyder. (J. & E., p. 86.)
One example from Honolulu.

Family XXXV. MURÆNIDÆ (Morays).

MURÆNA Linnæus.

86. *Muræna kailuæ* Jordan and Evermann. *Puhi kauila*; *Puhi oa*. (J. & E., p. 88.)

The two nominal species, *Muræna lampra* Jenkins and *Muræna kauila* Jenkins, seem to be color variations of this highly variable species, the body of which is brown, marked by white spots, often dark-ringed and of various sizes and forms, usually largest on the tail.

ENCHELYNASSA Kaup.

87. *Enchelynassa canina* (Quoy and Gaimard). (J. & E., pp. 90, 91.)
Enchelynassa bleekeri Kaup.
Gymnothorax vinolentus Jordan and Evermann.
A very large Moray, found occasionally about Hawaii and Samoa.

GYMNOTHORAX Bloch.

(Lycodontis McClelland.)

88. **Gymnothorax eurostus** (Abbott). (J. & E., p. 92.)
Hawaii, not seen since the original description.
89. **Gymnothorax laysanus** (Steindachner). (J. & E., p. 93.)
Not rare about Honolulu.
90. **Gymnothorax meleagris** (Shaw). (J. & E., p. 94.)
South Seas, rare about Honolulu.
91. **Gymnothorax steindachneri** Jordan and Evermann. (J. & E., p. 101.)
Not rare about Honolulu.
92. **Gymnothorax gracilicauda** Jenkins. (J. & E., p. 94.)
Rare; possibly the young of *G. steindachneri*.
93. **Gymnothorax ercodes** Jenkins. (J. & E., p. 95.)
One known from Honolulu.
94. **Gymnothorax berndti** Snyder. (J. & E., p. 98.)
Rare about Honolulu.
95. **Gymnothorax undulatus** (Lacépède). *Puhi laumili*. (J. & E., p. 98.)
The commonest Moray about Hawaii and especially ferocious.
96. **Gymnothorax flavomarginatus** (Rüppell). (J. & E., p. 99.)
Rather common.
97. **Gymnothorax thalassopterus** Jenkins. (J. & E., p. 99.)
Rare. Perhaps a variant of *G. flavomarginatus*.
98. **Gymnothorax goldsboroughi** Jordan and Evermann. (J. & E., p. 100.)
One specimen known.
99. **Gymnothorax petelli** (Bleeker). (J. & E., p. 100.)
(*Gymnothorax leucacme* Jenkins.)
Rather common and widely diffused.
100. **Gymnothorax mucifer** Snyder. (J. & E., p. 97.)
Honolulu, one example.
101. **Gymnothorax leucostictus** Jenkins. (J. & E., p. 96.)
Two examples from Honolulu.
102. **Gymnothorax waialuæ** Snyder. (J. & E., p. 97.)
One specimen from Waialua Bay, Oahu.
103. **Gymnothorax hilonis** Jordan and Evermann. (J. & E., p. 102.)
One example from Hilo.
104. **Gymnothorax nuttingi** Snyder. (J. & E., p. 103.)
Only one example known.

105. *Gymnothorax pictus* (Ahl). *Puhi kapa'a*. (J. & E., p. 103.)

Common and variable, widely diffused.

106. *Gymnothorax xanthostomus* Snyder. (J. & E., p. 104.)

Honolulu, rare.

EURMYCTERA Kaup.

107. *Eurymyctera acutirostris* (Abbott). (J. & E., p. 105.)

Not seen since the original discovery; the species has been redescribed and figured by Fowler.

ECHIDNA Forster.

108. *Echidna zebra* (Shaw). (J. & E., p. 106.)

Scarce about Hawaii; common in the South Seas.

109. *Echidna tritor* (Vaillant and Sauvage). (J. & E., pp. 106, 107, 108, 109.)

(*Echidna obscura* Jenkins.)

Abundant and excessively variable in color.

It is believed that the nominal species *E. leihala* Jenkins, *E. psalion* Jenkins, *E. zonata* Fowler, *E. vineta* Jenkins, and *E. zonophæa* Jordan and Evermann are all variants of *E. tritor*, which is plain in color with a black spot at the angle of the mouth. These are variously marked with dark cross-bands, scarcely any two specimens being colored alike. The alleged differences in dentition need verification.

110. *Echidna nebulosa* (Ahl). *Puhi kapa*. (J. & E., p. 110.)

Common and widely distributed.

UROPTERYGIUS Rüppell.

(*Ichthyophis* Kaup, preoccupied.)

111. *Uropterygius marmoratus* (Lacépède). (J. & E., p. 111.)

South Seas, scarce about Hawaii.

112. *Uropterygius leucurus* Snyder. (J. & E., p. 112.)

Only one specimen known.

SCUTICARIA Jordan and Snyder.

113. *Scuticaria tigrina* (Lesson). (J. & E., p. 112.)

South Seas, occasional about Hawaii.

Order SYNENTOGNATHI.

Family XXXVI. BELONIDÆ (Needle-fishes).

PLATYBELONE Fowler.

(*Eurycaulus* Ogilby, Proc. Royal Soc. Queensland, XXI, 1908, p. 91, type *Belone platyura* Bennett, is preoccupied, and *Platybelone* Fowler, Jan., 1919, is substituted. The gill-rakers are present as in *Belone*, the tail is broad, depressed, and keeled.)

114. *Platybelone platyura* (Bennett). (J. & E., p. 122.)

South Seas. Not rare about Hawaii.

TYLOSURUS Cocco.

115. *Tylosurus giganteus* (Temminck and Schlegel) *Aha aha*; *Auau*. (J. & E., p. 124.)

This large Hawaiian fish requires to be compared with the original species from Japan. Not rare in the open sea.

ABLENNES Jordan and Fordice.

(Originally written in error *Athlennes*.)

116. *Ablennes hians* (Cuvier and Valenciennes). (J. & E., p. 125.)

It is very doubtful whether the rare Hawaiian form is identical with *A. hians* of the West Indies.

Family XXXVII. HEMIRHAMPHIDÆ (Half-beaks).

HYPORHAMPHUS Gill.

117. *Hyporhamphus pacificus* (Steindachner). (J. & E., p. 126.)

Common at times.

HEMIRHAMPHUS Cuvier.

118. *Hemirhamphus depauperatus* Lay and Bennett. *M'é'mé'e*; *Iheihe*.

Locally abundant.

EULEPTORHAMPHUS Gill.

119. *Euleptorhamphus longirostris* (Cuvier). *Iheihe*. (J. & E., p. 128.)

Not rare in the open sea.

Family XXXVIII. EXOCÆTIDÆ (Flying-fishes).

FODIATOR Jordan and Meek.

120. *Fodiator rostratus* (Günther). (J. & E., p. 131.)

One example taken in Hawaii. The species seems to differ from *Fodiator acutus* of the Panama region in the subvertical mouth and the shorter lower jaw. It is nearer *Fodiator* than *Parexocætus*.

EVOLANTIA Snodgrass and Heller.

121. *Evolantia microptera* (Cuvier and Valenciennes). (J. & E., p. 130.)

Scarce about Hawaii.

PAREXOCÆTUS Bleeker.

122. *Parexocætus brachypterus* Solander. *Pukiku*. (J. & E., p. 131.)

Very common, not exceeding seven inches.

EXOCÆTUS Linnæus.

(Ventral fin short, median.)

Exocætus Linnæus, Syst. Nat., Ed. X, 1758, p. 316. Type *Exocætus volitans*, lately shown to be based on an example of the species called *Halocypselus evolans* (Linnæus).

Halocypselus Weinland, Proc. Bost. Soc. Nat. Hist., VI, 1858, p. 385 (*mesogaster* = *evolans* = *volitans*).

123. *Exocætus volitans* Linnæus. (J. & E., p. 132.)

By a confusion incident to correction of synonymy the plate on page 133, Jordan and Evermann, named "*Exocætus volitans*," represents the species sometimes called by that name, = *Exocætus rubescens* Rafinesque, not the true *E. volitans*, which has short ventral fins.

EXONAUTES Jordan and Evermann.

(Anal fin not shorter than dorsal.)

124. *Exonastes gilberti* Snyder. (J. & E., p. 134.)

Rare. The species from near Samoa, identified by Jordan and Seale as *Exocætus unicolor* Cuvier and Valenciennes, figured on page 209 of the "Fishes of Samoa," is very close to *Exonastes gilberti* and perhaps the same. In the specimens of both, as figured, is the parasitic copepod *Penella*, to which a parasitic barnacle (*Conchoderma*) is attached.

CYPSELURUS* Swainson.

(Anal fin much shorter than dorsal; young (always?) with barbel at the chin.)

125. *Cypselurus simus* (Cuvier and Valenciennes). *Malolo*. (J. & E., p. 134.)

The commonest large flying-fish about Hawaii, reaching a length of fourteen inches. The pectoral fins are usually, but not always, spotted with black.

126. *Cypselurus spilonotus* (Bleeker). *Malolo*. (J. & E., p. 136.)

Cypselurus bahiensis Jordan and Evermann, p. 136; probably not *Exocætus bahiensis* Ranzani.

Usually common about Hawaii. A very large species, reaching twenty inches in length. It is known in life by its dark reddish-brown pectorals, which become blackish in spirits. The dorsal fin is largely black. The species is most likely distinct from the Atlantic form called *C. bahiensis*.

127. *Cypselurus atrisignis* Jenkins. (J. & E., p. 136.)

Rare. Dorsal fin with a large black spot.

Family XXXIX. MACROURIDÆ (Grenadiers).

(Coryphænoididæ.)

GADOMUS Regan.

128. *Gadomus melanopterus* Gilbert. (G., p. 658.)

Deep water off Kauai.

129. *Gadomus bowersi* Gilbert. (G., p. 659.)

Deep water off Bird Island.

MELANOBRANCHUS Regan.

130. *Melanobranchnus micronemus* Gilbert. (G., p. 661.)

Deep water, Pailolo Channel.

CHALINURA Goode and Bean.

131. *Chalinura ctenomelas* Gilbert and Cramer. (G., p. 662.)

Deep sea, very abundant.

OPTONURUS Günther.

132. *Optonurus atherodon* Gilbert and Cramer. (G., p. 663.)

Deep sea; the most abundant member of the group.

*The International Commission of Nomenclature has decided that the spelling *Cypsilurus* of

* Swainson is to be regarded as a misprint.

HYMENOCEPHALUS Giglioli.

133. *Hymenocephalus striatulus* Gilbert. (G., p. 665.)
Deep sea off Oahu.
134. *Hymenocephalus aterrimus* Gilbert. (G., p. 666.)
Kanai, in very deep water.
135. *Hymenocephalus antræus* Gilbert and Cramer. (G., p. 663.)
Deep sea, extremely abundant. A valid species, not to be confounded with
H. aterrimus Gilbert.

MACROURUS Bloch.

(This genus, distinguished by the subinferior mouth, is merged into *Coryphænoides* by Hubbs.)

136. *Macrourus ectenes* Gilbert and Cramer. (G., p. 667.)
Deep sea. One specimen known.
137. *Macrourus propinquus* Gilbert and Cramer. (G., p. 667.)
Deep sea off Kauai.
138. *Macrourus holocentrus* Gilbert and Cramer. (G., p. 668.)
Deep sea off Oahu. One specimen known.
139. *Macrourus gibber* Gilbert and Cramer. (G., p. 668.)
Deep sea; frequent.
140. *Macrourus burragei* Gilbert. (G., p. 668.)
Deep sea off Oahu; one specimen known.
141. *Macrourus obliquatus* Gilbert. (G., p. 670.)
Deep sea off Kauai. Only one specimen known.
142. *Macrourus hebetatus* Gilbert. (G., p. 671.)
Deep sea off Oahu, one specimen known.
143. *Macrourus longicirrhus* Gilbert. (G., p. 672.)
Deep sea off Kauai. Only the type known.

CÆLORHYNCHUS Giorna.

144. *Cælorhynchus gladius* Gilbert and Cramer. (G., p. 673.)
Deep sea.
145. *Cælorhynchus aratrum* Gilbert. (G., p. 674.)
Deep sea. Rather scarce.
146. *Cælorhynchus doryssus* Gilbert. (G., p. 675.)
Deep sea. Occasional.

MATŒOCEPHALUS Berg.

(Cælocephalus Gilbert and Cramer; preoccupied.)

- 147.
- Matæocephalus acipenserinus*
- (Gilbert and Cramer). (G., p. 676.)

Deep sea. Common.

MALACOCEPHALUS Günther.

- 148.
- Malacocephalus hawaiiensis*
- Gilbert. (G., p. 677.)

Deep sea off Oahu.

TRACHONURUS Günther.

- 149.
- Trachonurus sentipellis*
- Gilbert and Cramer. (G., p. 679.)

Deep sea, frequent.

Family XL. GADIDÆ.

ANTIMORA Günther.

- 150.
- Antimora microlepis*
- Bean. (G., p. 656.)

Deep sea off Kauai. An Alaskan species.

LÆMONEMA Günther.

- 151.
- Læmonema rhodochir*
- Gilbert. (G., p. 657.)

Deep sea off Oahu. But one specimen known.

PHYSICULUS Kaup.

- 152.
- Physiculus grinnelli*
- sp. nov. Jordan and Jordan. (Pl. I, fig. 3.)

Type: No. 3898 Carnegie Museum. Twelve and one-half inches long.
Found in the market at Honolulu.

Head 4 in length to base of caudal; depth 4.8; eye 4.66 in head; snout 4.66; maxillary 2.16; barbel 4.5; height of first dorsal 2.5; length of ventral 1.16; pectoral 1.33; caudal 2; dorsal rays 7-73; anal rays 65; ventral rays 6; scales 6-127-26.

Body moderately elongate, deepest under the first dorsal, the tail rather slender; head somewhat flattened, the profile depressed above the eye; mouth moderate; the lower jaw included; the narrow maxillary reaching about to posterior margin of eye; gill-rakers very short, blunt; eye moderate. First dorsal rather low, one and four-fifths times as high as long; second dorsal moderate, co-terminous with anal; caudal rounded. Ventrals reaching well past front of anal. Scales small, smaller posteriorly and below; snout and lower jaw scaleless. Soft fins with small scales; lateral line well developed. Color plain dusky, paler below, edges of fins darker.

This species requires to be compared with *Physiculus japonicus* Hilgendorf from Tokyo. The following is the scanty description (*Gesellsch. Naturforsch. Freunde Berlin*, 1879, p. 80):

"Von der Gattung *Physiculus* sind bisher 3 Arten bekannt geworden; die erste, *Ph. dalwigkii* KP. wieder von Madeira, ist von unserer durch folgende Merkmale zu unterscheiden. Bei *Ph. japonicus* ist die Kopflänge in der Körperl. (ohne Caud.) 5mal enthalten (bei *P. Dalwigkii* 4mal). Interorbitalraum gleich dem vertikalen Augendurchmesser (statt kleiner), D. I. ist $1\frac{1}{3}$ mal so hoch als lang (2 mal), und die Höhe unter halber Kopflänge (gleich der halben), die Fäden der V. erreichen die A. (nicht). B. 7, D. 9/66, A. 73, V. 7. Die anderen beiden Arten, von Cuba und Südaustralien, sind durch die Flossenformal hinreichend getrennt. Mus. Ber. No. 10624."

Order ZEOIDEA.

Family XLI. ZEIDÆ (John Dories).

STETHOPRISTES Gilbert.

153. *Stethopristes eos* Gilbert. (G., p. 622.)

Deep sea, Pailolo Channel.

CYTTOMIMUS Gilbert.

(The presence of six soft rays in the ventral fins indicates that this genus belongs to the *Zeidæ* rather than to the *Caproidæ*.)

154. *Cyttomimus stelgis* Gilbert. (G., p. 624.)

Deep sea off Oahu; but one specimen known:

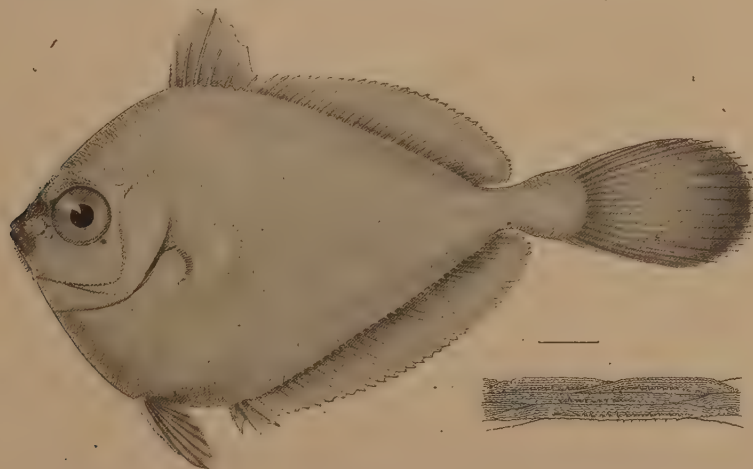


FIG. 1. *Vesposus egregius* Jordan. (Reproduced from Proc. U. S. N. M., Vol. 59, 1921, p. 650.)

Family XLII. GRAMMICOLEPIDÆ.

VESPOSUS Jordan.

155. *Vesposus egregius* Jordan.

(Proc. U. S. Nat. Mus., LIX, 1921, p. 650.)

Deep sea off Hawaii; the type killed in overflow of lava from Mauna Loa.

Order CHONDRICTHYES.

Family XLIII. ATELEOPIDÆ.

ATELEOPUS Temminck and Schlegel.

(Podateles Boulenger, there being already a genus *Atelopus*.)156. *Ateleopus plicatellus* Gilbert. (G., p. 653.)

Deep sea, Pailolo Channel.

Order HETEROSOMATA.

Family XLIV. PLEURONECTIDÆ.

PÆCILOPSETTA Günther.

157. *Pæcilopsetta hawaiiensis* Gilbert. (G., p. 679.)

Deep sea, Pailolo Channel.

TÆNIOPSETTA Gilbert.

158. *Tæniopsetta radula* Gilbert. (G., p. 680.)

Deep sea, Pailolo Channel.

PLATOPHRYS Swainson.

159. *Platophrys mancus* (Broussonet). (J. & E., p. 513; G., p. 684.)(*Rhomboidichthys pavo* Günther.)

Occasionally taken.

160. *Platophrys pantherinus* (Rüppell). (J. & E., p. 512.)

Generally common about Hawaii.

161. *Platophrys chlorospilus* Gilbert. (G., p. 684.)

Off Maui in deep water.

162. *Platophrys inermis* Gilbert. (G., p. 685.)

Deep sea, Pailolo Channel.

163. *Platophrys coarctatus* Gilbert. (G., p. 686.)

Deep sea.

This species and the preceding, with the interorbital very narrow, diverge considerably from the type of *Platophrys*.

SCÆOPS Jordan and Starks.

(*Platophrys* Günther, non Swainson.)

164. *Scæops hawaiiensis* (Jordan and Evermann). (J. & E., p. 514; G., p. 687.)

165. *Scæops xenandrus* (Gilbert). (G., p. 687.)

Common in rather deep water.

166. *Scæops arenicola* (Jordan and Evermann). (J. & E., p. 515.)

Among the large-scaled flounders known by the very narrow interorbital, thus approaching *Engyprosopon* Günther, but the gill-rakers are very short, as in *Scæops*.

ANTICITHARUS Günther.

167. *Anticitharus debilis* Gilbert. (G., p. 683.)

Deep sea, Pailolo Channel.

CHASCANOPSETTA Gilbert.

168. *Chascanopsetta prorigera* Gilbert. (G., p. 689.)

Deep sea, off Maui.

PELECANICHTHYS Gilbert and Cramer.

169. *Pelecanichthys crumenalis* Gilbert and Cramer. (G., p. 690.)

Deep sea.

SAMARISCUS Gilbert.

170. *Samariscus corallinus* Gilbert. (G., p. 682.)

Deep sea, off Molokai.

Family XLV. CYNOGLOSSIDÆ (Soles).

SYMPHURUS Rafinesque.

171. *Symphurus undatus* Gilbert. (G., p. 690.)

Deep sea, off Oahu.

172. *Symphurus strictus* Gilbert. (G., p. 691.)

Deep sea, off Oahu.

Order **XENOBERYCES.**Family XLVI. **MELAMPHAIDÆ.****MELAMPHAËS** Günther.

- 173.
- Melamphaës unicornis**
- Gilbert. (G., p. 615.)

Deep sea, off Kauai.

CAULOLEPIS Gill.

- 174.
- Caulolepis longidens**
- Gill. (G., p. 616.)

Deep sea, perhaps distinct from the Atlantic form.

Order **BERYCOIDEI.**Family XLVII. **POLYMIXIIDÆ.****POLYMIXIA** Lowe.

- 175.
- Polymixia berndti**
- Gilbert. (G., p. 616.)

Deep sea, off Oahu.

Family XLVIII. **HOLOCENTRIDÆ** (Squirrel-fishes).**HOLOTRACHYS** Günther.

- 176.
- Holotrachys lima**
- (Cuvier and Valenciennes). (J. & E., p. 147.)

Common in Hawaii and throughout the South Seas.

OSTICHTHYS (Langsdorf) Jordan and Evermann.

- 177.
- Ostichthys pillwaxi**
- (Steindachner). (J. & E., p. 147.)

Very rare. Two specimens known from Honolulu.

MYRIPRISTIS Cuvier. (Frères Jacques.)

- 178.
- Myripristis multiradiatus**
- Günther.
- U'u.*
- (J. & E., p. 149.)

Abundant about Hawaii.

- 179.
- Myripristis chryseres**
- Jordan and Evermann.
- Pauú.*

Not rare about Hawaii.

- 180.
- Myripristis symmetricus**
- Jordan and Evermann. (J. & E., p. 151.)

Rather scarce.

- 181.
- Myripristis sealei**
- Jenkins. (J. & E., p. 151.)

Not rare.

- 182.
- Myripristis murdjan**
- (Forskål).
- U'u.*
- (J. & E., p. 152.)

The commonest species of the genus, widely dispersed throughout the Pacific. *Myripristis berndti* Jordan and Evermann, p. 153, is probably not distinct from *M. murdjan*.

183. *Myripristis argyromus* Jordan and Evermann. (J. & E., p. 154.)

One example known.

HOLOCENTRUS.

§ *Holocentrus*.

184. *Holocentrus diadema* Lacépède. *Alaihi kalaloo*. (J. & E., p. 159.)

Very common; one of the small species.

185. *Holocentrus microstomus* Günther. (J. & E., p. 160.)

Rather scarce.

186. *Holocentrus spinifer* (Forskål). (J. & E., p. 161.)

Rare about Hawaii.

187. *Holocentrus erythræus* Günther. (J. & E., p. 161.)

Scarce.

188. *Holocentrus punctatissimus* Cuvier and Valenciennes. (J. & E., p. 162.)

A small fish generally common about Hawaii.

189. *Holocentrus xantherythrus* Jordan and Evermann. (J. & E., p. 164.)

Common. The specific name of this species was rather unfortunately chosen, as its pale stripes are white, not yellow. The yellow streaks are characteristic of *H. ensifer*, for which the name was originally framed.

190. *Holocentrus ensifer* Jordan and Evermann. (J. & E., p. 165.)

Rather common.

§ *Flammeo* Jordan and Evermann.

191. *Holocentrus sammara* Forskål. (J. & E., p. 155.)

Common, widely diffused. This species and the next belong to the subgenus *Flammeo*, distinguished by the larger mouth and projecting chin, characters of minor importance.

192. *Holocentrus scythrops* Jordan and Evermann. (J. & E., p. 157.)

Abundant about Hawaii.

Order AULOSTOMI.

Family XLIX. AULOSTOMIDÆ (Trumpet-fishes).

AULOSTOMUS Lacépède.

193. *Aulostomus chinensis* (Linnæus). *Nunu*. (J. & E., p. 114.)

Common. The original description of "*Fistularia chinensis*" Linnæus included two Asiatic references and the species is said to inhabit the East Indies.

The specific name *chinensis* should therefore remain with the Asiatic form, known as *Aulostomus valentini* by some later authors.

Family L. FISTULARIIDÆ (Cornet-fishes).

FISTULARIA Linnæus.

194. *Fistularia petimba* Lacépède. (J. & E., p. 116.)

Abundant.

195. *Fistularia serrata* Cuvier. (J. & E., p. 116.)

Scarce about Hawaii.

Family LI. MACRORHAMPHOSIDÆ.

MACRORHAMPHOSUS Lacépède.

196. *Macrorhamphosus hawaiiensis* Gilbert. (G., p. 613.)

Off Laysan Island.

Order LOPHOBRANCHII.³

Family LII. SYNGNATHIDÆ.

MICROPHIS Kaup.

197. *Microphis pleurotænia* (Günther). (J. & E., p. 121.)

Rare. Off Honolulu.

ICHTHYOCAMPUS Kaup.

198. *Ichthyocampus erythræus* Gilbert. (G., p. 613.)

Off Molokai.

Family LIII. HIPPOCAMPIDÆ (Sea-horses).

HIPPOCAMPUS Rafinesque.

199. *Hippocampus hilonis* Jordan and Evermann. (J. & E., p. 119.)

One example from Hilo.

200. *Hippocampus fisheri* Jordan and Evermann. (J. & E., p. 119.)

Scarce.

Order HYPOSTOMIDES.

Family LIV. PEGASIDÆ (Sea-moths).

PEGASUS Linnæus.

201. *Pegasus papilio* Gilbert. (G., p. 614.)

Bird Island, and off Hawaii.

³ *Solenostomus cyanopterus* Bleeker has been reported from Hawaii in error.

Order SELENICHTHYES.

Family LV. LAMPRIDÆ (Moon-fishes).

LAMPRI Retzius.

202. *Lampris regius* (Bonnaterre). (J. & E., p. 166.)

An example, six feet long, was once taken at Honolulu. It weighed 217 lbs. The Honolulu "Star-Bulletin" in an issue early in 1922 reports the capture at a depth of 1200 ft. of a second specimen, weighing much less. It was taken thirteen miles west of Oahu.

Order PERCOMORPHI.

Suborder PERCESOCES.

Family LVI. ATHERINIDÆ (Siversides).

HEPSETIA Bonaparte.

203. *Hepsetia insularum* (Jordan and Evermann). (J. & E., p. 138.)

This little fish, common inside of the reefs, has the lower mandible straight, not abruptly elevated behind. It belongs, therefore, with most of the Pacific "Siversides" to the genus *Hepsetia*.

Family LVII. MUGILIDÆ (Mulletts).

MUGIL Linnæus.

204. *Mugil cephalus* Linnæus. *Ama-ama*. (J. & E., p. 139.)

The commonest food-fish in Honolulu, and one of the best, being largely reared in salt-water ponds. We have been unable to distinguish the Hawaiian form from the Striped Mullet of Europe, and therefore let it stand under the same name.

CHÆNOMUGIL Gill.

(This genus differs from *Chelon* Röse of the Mediterranean by having both jaws provided with papilliform teeth.)

205. *Chænomugil chaptalii* (Eydoux and Souleyet). *Uouôa*. (J. & E., pp. 140-141.)

Myxus pacificus Steindachner seems to be the young of this species.

Family LVIII. SPHYRÆNIDÆ (Barracudas).

SPHYRÆNA Lacépède.

§ *Sphyræna*.206. *Sphyræna helleri* Jenkins. *Kawalea*. (J. & E., p. 143.)

A small species, not exceeding two feet in length. Generally common.

§ *Agriosphyraena* Fowler.

(Giant barracudas with large scales, less than ninety.)

- 207.
- Sphyraena snodgrassi*
- Jenkins.
- Kaku*
- . (J. & E., p. 143.)

This large and fierce Barracuda is common in the markets, and reaches a length of six feet. The species requires to be compared with other large Barracudas of the South Seas.

Suborder *RHEGNOPTERI*.

Family LIX. POLYNEMIDÆ (Thread-fishes).

POLYNEMUS Linnæus.

(*Polydactylus* Lacépède.)

- 208.
- Polynemus sexfilis*
- Cuvier and Valenciennes.
- Moi; Moi-ii*
- . (J. & E., p. 144.)

Not rare at Honolulu.

Suborder *PERCIFORMES*.

Family LX. XIPHIIDÆ.

XIPHIAS Linnæus.

- 209.
- Xiphias gladius*
- Linnæus. (J. & E., p. 168.)

The common swordfish is occasionally taken at Honolulu.

Family LXI. ISTIOPHORIDÆ (Spear-fishes).

TETRAPTERUS Agassiz.

- 210.
- Tetrapterus mitsukurii*
- Jordan and Snyder.
- A'u*
- .

This large spear-fish, originally described from Japan, but since found to be abundant at Santa Catalina, may be seen every day in the Honolulu markets. It is taken in the open sea to the southwestward by Japanese fishermen. We have had no opportunity to compare Hawaiian specimens with those taken elsewhere. Pectoral longer than dorsal lobe.

ISTIOPHORUS Lacépède (Sail-fishes).

(*Histiophorus* of most recent authors.)

- 211.
- Istiophorus gladius*
- (Broussonet).

A cast of an example six feet long is in the Bishop Museum. It is not certain that the Atlantic form is really distinct from this. A photograph of the cast is given in fig. 2.

Family LXII. SCOMBRIDÆ (Mackerels).

PNEUMATOPHORUS Jordan and Gilbert.

212. *Pneumatophorus japonicus* (Houttuyn). *Opehu palahu*. (J. & E., p. 169.)

This small mackerel is rather rare about Hawaii. It needs comparison with the abundant geminate forms, *P. japonicus* of Japan and *P. diego* from California. *P. colias* of Europe and *P. grex* of our Atlantic coast also differ slightly, though all are very much alike. The "Chub-mackerels," *Pneumatophorus*, differ from the mackerel of commerce, *Scomber*, in the development of the air-bladder.

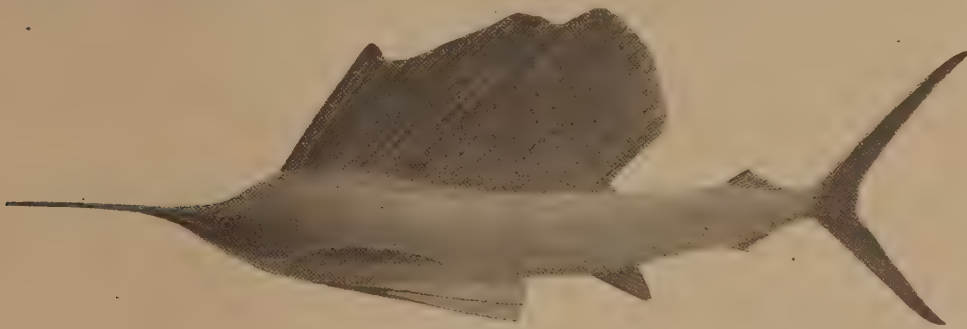


FIG. 2. *Istiophorus gladius* (Broussonet). From a cast in the Bernice Pauahi Bishop Museum, Honolulu.

AUXIS Cuvier (Frigate-mackerels).

213. *Auxis thazard* (Lacépède). (J. & E., p. 171.)

This pelagic fish requires to be compared with *A. rochei* of the Atlantic and *A. tapeinosoma* of Japan.

EUTHYNNUS Lütken (Oceanic Bonitos).

(We let this genus stand until it can be compared directly with *Gymnosarda unicolor*, the type of the allied genus *Gymnosarda*.)

214. *Euthynnus pelamis* (Linnæus). *Aku*. (J. & E., p. 172.)

This fish of the open sea is now very abundant in the markets of Honolulu and Hilo. It is extensively canned for commerce; more than any other species. The flesh is red, rather coarse, and oily. The better species of this group are not put up in tins, their use as fresh fish being more profitable. The best of them sell at present at fifty cents a pound in Honolulu. The various forms of striped "Oceanic Bonitos" found in the warm parts of the Atlantic and Pacific need comparison one with another.

215. *Euthynnus alleteratus* (Rafinesque). *Kāwakāwa*. (J. & E., p. 173.)

Very common in the markets. The young are taken in nets in the shallow waters of Hilo Bay. The flesh is paler than that of the *Aku*, and brings a higher

price; hence it is less frequently tinned. From two to six round black spots appear in the adult fish along the sides of the breast. These are not shown in the figure (No. 65) given by Jordan and Evermann. The Pacific form should be compared with true *E. alleteratus* of the Mediterranean.

SARDA Cuvier (Bonitos).

216. *Sarda chilensis* (Cuvier and Valenciennes). (J. & E., p. 175.)

Occasionally taken at Honolulu and canned with the *Aku*, packers making no fine distinctions. This species is quite different from the Atlantic Bonito, *Sarda sarda*, having the spinous dorsal always shorter. It is not quite certain that *Sarda lineolata* from California and *Sarda orientalis* from Japan are identical with *Sarda chilensis*.

THUNNUS South (Tunnies).

(*Thynnus* Cuvier; preoccupied.)

217. *Thunnus thynnus* Linnæus.

The great Tuna, regarded as identical with the European, and which is abundant about Santa Catalina Island, California, is not yet definitely known from Hawaii.

218. *Thunnus orientalis* (Temminck and Schlegel).

A specimen seen in the market at Honolulu seemed distinct from the Californian Tuna, having the finlets dull yellow instead of blue. According to our notes the dorsal and anal lobes are high, the pectoral rather short, reaching two-thirds distance to anal. Finlets all dull soiled yellowish. Belly with twelve obscure pale cross-bars of grayish silvery, narrower than the interspaces, replaced by round spots above and below; smaller spots alternating with the bars; no clear yellow on fins. The silvery markings are characteristic of the young of several species of this group.

GERMO Jordan (Albacores).

This group or subgenus differs from *Thunnus* only in the great length of the ribbon-like pectoral fins, which reach at least to the front of the anal, two and one half to three times in length of body. It should perhaps be merged in *Thunnus*. The species of this genus are much in need of careful revision.

219. *Germo macropterus* Temminck and Schlegel. *Ahi*. (J. & E., p. 174.)

(*Germo germo* Jordan and Evermann.)

This species, found both in California and Japan, is now rather abundant in the Honolulu markets. It reaches a weight of three hundred pounds. Dorsal and finlets all bright lemon-yellow without dark borders. The sides have faint

elongate dull silvery spots, not cross-bands. The dorsal and anal are very high and falcate. The flesh is coarse and red, like that of the *Aku*, with which it is often canned.

This species was recorded by Jordan and Evermann in 1901 as *Germo germo*. It is brought in from deep water by the Japanese fishermen.

220. *Germo sibi* (Temminck and Schlegel).

Soft dorsal moderately elevated, its lobe shorter than snout. Pectoral long, falcate, reaching to the second dorsal finlet. Finlets above bright yellow bordered by dark, the narrow margin white, the produced tips white; anal finlets all pale with no yellow. Flesh dark. Sides without distinct silvery markings.

A large fish, frequently seen in the markets, and evidently distinct from *G. macropterus* and *G. alalunga*. It seems to be very near *G. sibi* of Japan, but its identity cannot be positively decided without actual comparison of specimens.

221. *Germo alalunga* (Gmelin).

(? *Scomber germo* Lacépède = *Thynnus pacificus* Cuvier and Valenciennes.)

Another long-fin is occasionally taken with the others. Upon superficial examination it seems to be the same as the Californian Albacore, supposed to be *Germo alalunga*. Finlets all blue with no trace of yellow. Pectoral very long, reaching middle of dorsal lobe. Flesh pale. Weight twelve to fifteen pounds. This may be *Scomber germo* of Lacépède (*pacificus* C. & V.), but the long descriptions of that author reveal no points of difference and the color of the finlets is not mentioned.

In Jordan and Evermann, "Fishes of North and Middle America," pp. 870-871, in the account of *Thunnus thynnus* and *Germo alalunga*, the references to the flesh of the two are accidentally transposed. The flesh of the Tuna (*Thunnus*) is "coarse and oily"; that of the Albacore (*Germo*) is "excellent, that even of very large individuals being of fine flavor."

222. *Germo argentivittatus* (Cuvier and Valenciennes).

Dr. Nichols tells me that a specimen sent by Dr. Evermann in 1920 to the American Museum of Natural History corresponds to this species from "the Indian seas." The color of the body, as stated by Cuvier and Valenciennes, corresponds to that of *Thunnus orientalis*, but the long pectorals are said to be three and one-half in the length of body, not seven, as in Schlegel's account of *orientalis*.

ACANTHOCYBIUM Gill (Petos).

223. *Acanthocybium solandri* (Cuvier and Valenciennes). *Ono*.

This large fish is now common in the market of Honolulu, being taken with the hook in deep water thirty miles or more from the harbor by the Japanese. The flesh is excellent, being too costly to be used for canning. Jordan and Thompson have noticed that the Japanese form, *Acanthocybium sara*, is very distinct from *A. solandri*. The Cuban Peto, *A. petus* Poey, is also different.

Brown, with narrow faint silvery cross-bars on sides. Teeth 75/60 on each side, compressed, smaller inwards; pectorals a little shorter than maxillary.

The account of this species, given by Jordan and Evermann, is drawn from a Cuban example of *Acanthocybium petus*. The Japanese fish, *Acanthocybium sara*, called in Japan *Okisawara*, or "off-shore *Sawara*," has the teeth much larger, 18/20 on either side, the snout blunter, the body less slender. (See Jordan and Metz, Memoirs Carnegie Museum, VI, p. 27.)

The description copied by Cuvier and Valenciennes from Solander is not distinctive, and no locality is assigned to the species. As Solander collected principally about Tahiti, it is presumable that his species is the present. The huge size of these fishes debars them from collections.

Family LXIII. GEMPYLIDÆ (Snake-mackerels).

RUVETTUS Cocco.

224. *Ruvettus pacificus* sp. nov. Jordan and Jordan. *Walv.* (J. & E., p. 177.)
Type: No. 04314, U. S. N. M.

A single specimen, four and one half feet long, weighing forty pounds, was obtained by Jordan and Evermann from Honolulu. This is the only record, so far as we know, from the Pacific. This example we may take as the type of a new species.

It is well described and figured by Jordan and Evermann under the name of *Ruvettus pretiosus* Cocco, but it differs from the Atlantic species in the number of fin-rays (D. XII, 15, II; A. 16, II, instead of D. XV, 18, II; A. 17-II) and in the deeper body, the depth being 5.4 instead of 6. It has been recorded from Japan.

PROMETICHTHYS Gill.

(*Prometheus* Lowe, preoccupied.)

225. *Prometichthys prometheus* (Cuvier and Valenciennes). (J. & E., p. 178.)

Not rare in the open sea, occasionally brought into the markets. Our specimens seem identical with others from Japan. The Pacific form, *Prometichthys solandri* Cuvier and Valenciennes needs comparison with material from the Atlantic.

GEMPYLUS Cuvier.

(*Lemnisoma* Lesson (1830). *Gempylus* Cuvier (1829) has priority.)

226. *Gempylus serpens* Cuvier and Valenciennes. *Hauiliuli puhi*. (J. & E., p. 179.)

This rare fish is known from a painting at Hilo by Andrew Garrett and one at Honolulu by Mrs. J. B. Dillingham. Whether the Pacific form, *G. thyrsoitoides* Lesson, differs from *G. serpens* of the Atlantic we cannot tell.

Family LXIV. CORYPHÆNIDÆ (Dolphins).

CORYPHÆNA Linnæus.

227. *Coryphæna hippurus* Linnæus. *Mahihi*; *Māhimāhi*. (J. & E., p. 204.)

Now very common in the markets. Dorsal rays 54 to 58.

228. *Coryphæna equisetis* Linnæus. (J. & E., p. 205.)

Recorded by Bennett and by Günther. Not seen by us.

Family LXV. NOMEIDÆ.

ARIOMMA Jordan and Snyder.

(It is not evident that this genus differs from *Cubiceps* Lowe of the Atlantic.)

229. *Ariomma lurida* Jordan and Snyder. (J. & E., p. 217.)

Pelagic. Two specimens from the markets in Honolulu. Two casts of this rare species of the open seas are in the Bishop Museum, from examples in much better condition than the original types.

230. *Ariomma evermanni* Jordan and Snyder.

(Jordan and Snyder, Bull. U. S. Fish Comm., XXVI, 1906, p. 209.)

Open sea. Only the type, from off Honolulu, is known.

Family LXVI. BRAMIDÆ (Sea-brems).

COLLYBUS Snyder.

231. *Collybus drachme* Snyder. (J. & E., p. 203.)

Open sea, scarce. Originally known from several young examples, some of them from the stomach of a dolphin (*Coryphæna*). A cast of a large example is in the Bishop Museum.

EUMEGISTUS gen. nov. Jordan and Jordan.

Type: *Eumegistus illustris* Jordan and Jordan.

This genus is nearly allied to *Brama*, differing in its much larger scales, which, at least in the adult, are smooth, entirely without vertical ridge, or emargination.

Teeth small, sharp, even, in broad bands, none on vomer or palatines. Lateral line well developed. Each ray of dorsal and anal with a series of scales; these fins falcate, the front lobe acute. Caudal deeply forked, the lobes acute. Pectorals long, falcate. Maxillary scaly. Snout and lower jaw naked. Gill-rakers of moderate length, stiff and strong, not numerous, the number about $X + 12$, the longest about half of eye.

232. *Eumegistus illustris* sp. nov. Jordan and Jordan. (Pl. II, fig. 1.)

Type: No. 3899, C. M., Honolulu. Collector D. S. Jordan.

Head 3.4 in length; depth 2; dorsal rays III, 28; anal rays II, 20; ventrals I, 5; scales 9-58-22; eye 3.5 in head; snout 4.5; maxillary 1.75.

Body broadly ovate, its outlines regular; an even curve from tip of snout to dorsal, a similar curve below; caudal peduncle rather slender. Head mode ate, high above eye; preorbital narrow; maxillary broad, its diameter at tip two-fifths of eye, extending to below middle of the large eye; mouth very oblique, the lower jaw heavy and projecting, its tip entering the profile. Preopercle entire, evenly rounded; opercle without spine or angle; scales on head small, smaller about the eye, lower jaw and forehead scaleless or nearly so. Scales on body thick, smooth, without emargination or vertical ridge, those on sides much larger than those along bases of dorsal and anal; each ray of dorsal and anal with a series of scales, each scale broader than high; lateral line well developed, concurrent with the back; a long scaly appendage at base of ventrals, the soft rays of which fin are also scaly. Lobe of dorsal acute, 1.1 in head, 2.1 in depth of body; anal lobe 3 in depth; upper caudal lobe slightly the longer, 1.9 in depth in fin, deeply lunate, with produced tips; pectoral reaching seventeenth dorsal ray, 1.6 in depth of body; ventrals short, 3.5 in depth.

Color lustrous brownish black; the edge of dorsal and anal black above the paler scales; posterior edge of caudal abruptly white; outer edges of pectorals and ventrals also white.

The type of this species is a single specimen found in the market of Honolulu. It was about two feet in length, weighing nearly nine pounds. It was regarded as one of the best food-fishes, selling at fifty cents per pound, but no one seems to have ever seen it before. On account of its great bulk the senior author was unable to take the fish as a whole, but only those parts which upon the plate are delineated in detail. The white parts of this figure were left behind to be sold by the dealer.

Family LXVII. CARANGIDÆ (Cavallas).

The tropical species of this family are widely spread and very closely related among themselves. Our collections from Hawaii have been sent to Mr. John T. Nichols of the American Museum of Natural History to be used in a proposed monograph of the group. The present list is therefore tentative, based mainly on the account given by Jordan and Evermann, and liable after revision to undergo considerable change. A few indications given in a letter from Mr. Nichols are here accepted, as also the identification of *Caranx bixanthopterus* made in an unpublished paper by Yosiro Wakiya.

SCOMBEROIDES Lacépède (Leather-jackets).

233. *Scomberoides tolooparah* (Rüppell). *Laë*. (J. & E., p. 180.)

The species doubtfully listed under this name is common at Honolulu.

234. *Scomberoides sancti-petri* (Cuvier and Valenciennes). (J. & E., p. 181.)

Not common; the identification uncertain.

NAUCRATES Rafinesque.

235. *Naucrates ductor* (Lacépède). (J. & E., p. 182.)

Very rare. The Pacific form, *Naucrates indicus* (Lesson), needs comparison with the pelagic form from the Atlantic.

SERIOLA Cuvier (Amber-fishes).

236. *Seriola purpurascens* Temminck and Schlegel. *Kahāla*; *Páakahāla*. (J. & E., p. 183.)

Supposed to be identical with the Japanese species.

237. *Seriola sparna* Jenkins. *Kahāla opio*. (J. & E., p. 184.)

Rare. One large specimen was seen in the market. It may be the same as *Seriola quinqueradiata* of Japan. Color plain, without lateral stripes, and the fins rather low.

ELAGATIS Bennett (Runners).

(*Irex* Valenciennes.)

238. *Elagatis bipinnatulus* (Quoy and Gaimard). (J. & E., p. 185.)

One fine specimen taken by us in Honolulu. I fail to find that the Atlantic species, *E. pinnatulus* (Poey), differs from *E. bipinnatulus* of the Pacific.

DECAPTERUS Bleeker.

239. *Decapterus pinnatulus* (Eydoux and Souleyet). *Opélu*. (J. & E., p. 186.)

Very abundant in the Honolulu market in August. It is sometimes canned as "Sardines."

240. *Decapterus maruadsi* (Temminck & Schlegel).

A large species of *Decapterus* is represented by two examples in our collection from Honolulu. It has been sent to the American Museum of Natural History to be studied by Mr. Nichols, who regards it as identical with *D. maruadsi* of Japan. The lower jaw with very weak teeth, mouth otherwise toothless. Length eighteen inches.

SELAR Bleeker.

(*Trachurops* Gill.)

The genus *Selar* was based upon various slender species belonging to *Trachurus*, *Trachurops*, and *Atule* of other writers. The first logotype, chosen by Jordan and Evermann, was *Caranx boöps* Bleeker. According to Fowler this is a species of *Trachurops*. *Selar* must therefore replace the latter name.

241. *Selar mauritianus* (Quoy and Gaimard). *Akule*; *Halalahu*.

Trachurops crumenophthalma of authors; probably not the same as the latter, which is an Atlantic species.

ATULE gen. nov. Jordan and Jordan.

Type: *Caranx affinis* Rüppell.

This genus has the form of *Selar* (*Trachurops*). Elongate, the back low, without the peculiar notching of the shoulder-girdle distinctive of that genus, and with the last ray of the dorsal and of the anal semi-detached, joined by a low membrane to the rest of the fin. Like *Selar* and *Caranx* it has bony plates only on the straight posterior part of the lateral line. Teeth in jaws slender, small; vomer, palatines, and tongue with minute teeth. *Atule* (*Akule* in Hawaii) is the common name of fishes of this type in Polynesia.

242. *Atule lundini* (Jordan & Seale). *Amuka*; *Púakahála*. (J. & E., p. 195.)

? *Caranx affinis* Rüppell, Neue Wirbelthiere, 1838, p. 49, pl. XIV, fig. 1. Red Sea.

? *Selar hasselti* Bleeker, Verh. Batav. Genootsch., XXIV, 1852, p. 53. Moluccas.

Decapterus lundini Jordan and Seale, "Fishes of Samoa," 1906, p. 229. Apia.

Very common at Honolulu. Mr. Nichols finds tangible differences between the form in Hawaii and Samoa and the African *affinis*. He regards *A. lundini* as a subspecies of *A. affinis*, of which *hasselti* is a synonym.

243. *Atule polita* (Jenkins). *Maka*. (J. & E., p. 194.)

A rare species at Honolulu, probably referable to this genus, though deeper in body than the type.

CARANX Lacépède.

(Tricropterus Rafinesque; Carangus Girard.)

Under this name we include the Carangoid fishes with the teeth in the jaws not in villiform bands, teeth on vomer and palatines; back more or less elevated, but not excessively so, and none of the dorsal spines filamentous. The group has been further subdivided by authors, but not very successfully. The proper logotype of *Caranx* is yet to be determined.

244. *Caranx ignobilis* (Forskål). *Pau'u*. (J. & E., p. 188.)

Carangus hippoides Jenkins.

This common and widely diffused species corresponds to *Caranx hippos* of the Atlantic. It is known from related species by the presence of a small patch of scales on the otherwise naked breast.

245. *Caranx rhabdotus* (Jenkins). (J. & E., p. 193.)

Carangus rhabdotus Jenkins.

A small deep-bodied species, marked by dark cross-bars. Anal fin yellow. It ascends into fresh waters. It has hitherto, perhaps correctly, been identified as *Caranx sexfasciatus* Quoy and Gaimard.

246. *Caranx melampygus* Cuvier and Valenciennes. *Ulua*. (J. & E., p. 191.)

Caranx bixanthopterus Rüppell.

Caranx forsteri Jordan and Evermann, *non* Cuvier and Valenciennes.

This species, distinguished from *C. ignobilis* by the scaly breast, is one of the most abundant and valued food-fishes of Hawaii. There, as elsewhere throughout the South Seas, it is known as *Ulua*. It corresponds to *Caranx latus* of the Atlantic. Pectoral fin bright yellow in life, anal dusky. It has been wrongly identified with *C. forsteri* C. & V., a species with fewer fin-rays. Wakiya regards *C. bixanthopterus* as the same species. *C. heberi* has fewer fin-rays.

In the original description of this species it is said: Ce poisson paraît d'ailleurs avoir été argenté, et teint vers le dos d'un plumbe verdâtre; Les deux pointes de ses nageoires sont noirâtres, mais celle de l'anale plus que l'autre."

All this applies perfectly to the *Ulua*, but the dusky "*Omilu*" with the sides sprinkled with small black points, could never have been described in this way. Both the *Ulua* and the *Omilu* have dorsal rays in increased number—D. I. 23 or 24; A. I. 19 or 20. The *Ulua* is known in life by its dusky anal (hence *melampygus*) and its bright yellow pectoral.

247. *Caranx marginatus* Gill. (J. & E., p. 191.)

This species is very close to *Caranx forsteri*, but apparently distinct.

248. *Caranx elacate* (Jordan and Evermann). (J. & E., p. 190.)

Only the type is as yet known.

249. *Caranx stellatus* Quoy & Gaimard. *Omilu*; *Omilimilu*. (J. & E., p. 192.)

Caranx melampygus Günther and 'recent authors generally (not *C. melampygus* of Cuvier and Valenciennes).

Caranx punctatus Cuvier and Valenciennes (name preoccupied).

Caranx caeruleopinnatus Cuvier and Valenciennes (not of Rüppell).

A staple food-fish, not inferior to the *Ulua* and reaching a much larger size. Specimens seen in the market at Hilo were five feet long. It is known by its dusky coloration, the back and sides usually with scattered small black spots. This species is rather common at Honolulu, and is readily known by the traits mentioned above.

250. *Caranx thompsoni* Seale.

(Jordan and Evermann, "Fishes of the Hawaiian Islands," Addenda, p. 535.)

Honolulu. Only the type known.

251. *Caranx dason* Jordan and Snyder.

Only the type known.

URASPIS Bleeker.

(*Selenia* Bonaparte, Cat. Méthod., 1843, p. 75. Type *Caranx luna* St. Hilaire = *Scomber guara* Bonnaterre; *Uraspis* Bleeker, Amboyna, V, 1855, p. 418 (*carangoides*). The name *Selenia* is preoccupied.

Teeth in the jaws very small, in one or two series, none on vomer or palatines.

252. *Uraspis helvolus* (Forster). (J. & E., p. 196.)

A very rare species, taken only once at Honolulu.

253. *Uraspis cheilio* (Snyder). (J. & E., p. 196.)

A peculiar species with depressed head, elevated back, and thick lips. Described from a single large specimen. A second was obtained by us in the Honolulu market.

CARANGOIDES Bleeker.

We retain this name for species with small teeth in villiform bands in the jaws and on vomer and palatines.

254. *Carangoides jordani* sp. nov. Nichols (MS). *Omilu*.

We adopt the name proposed by Nichols for this common Hawaiian species, hitherto, but certainly wrongly, identified with *C. ferdau* of the Red Sea.

255. *Carangoides gymnostethoides* Bleeker. (J. & E., p. 199.)

Not seen by us.

256. *Carangoides evermanni* Nichols.

One specimen placed in the hands of Mr. Nichols, who regards the Hawaiian form as a subspecies of the preceding.

257. *Carangoides ajax* Snyder. (J. & E., p. 200.)

A huge fish of peculiar form, notable for the small number of its fin-rays. Taken but once in Honolulu.

ALECTIS Rafinesque.

258. *Alectis ciliaris* (Bloch). *Utua kihikihi*. (J. & E., p. 200.)

Not rare.

259. *Alectis indicus* (Rüppell).

A huge example, over two feet long, looking different from the small ones called *ciliaris*, was taken in the market. The relation of these two forms is yet to be established.

GNATHANODON Bleeker.

Jaws toothless; small teeth on tongue.

260. *Gnathanodon speciosus* (Forskål). *Páopáo*; *Utua pauú*. (J. & E., p. 197.)

Common in the markets of Honolulu, as well as throughout the South Seas.

Family LXVIII. KUHLLIIDÆ (Seseles).

KUHLLIA Gill.

(*Moronopsis* Gill; *Boulengerina* Fowler, Proc. Ac. Nat. Sci. Phila., 1906, p. 572.

Type *Dules mato* Lesson = *Dules malo* Cuv. & Val.)

§ *Kuhlia*.261. *Kuhlia malo* (Cuvier and Valenciennes). *Ahólehóle*. (J. & E., p. 207.)

Common in all running streams and descending to estuaries. The Hawaiian fish, called *sandvicensis* by Steindachner, needs further comparison with the original *malo* from Tahiti. Although the name *Dules mato* of Lesson, 1830, has apparent priority over *Dules malo* of Cuvier and Valenciennes, nevertheless the fact that Lesson quotes the latter in synonymy with the correct page shows that his report on the Voyage de la Coquille is later in date than Vol. VII of the *Histoire des Poissons*. The reference to *Boulengerina* on p. 507 of Jordan's "Genera of Fishes" is erroneous, and should be cancelled.

§§ SAFOLE Jordan.

(Proc. U. S. N. M., 1912, p. 655. Type *Dules taniurus* Cuv. & Val.)

262. *Kuhlia tæniura* (Cuvier and Valenciennes). (J. & E., p. 208.)

Known from Johnston Island, south of Hawaii. Common about lava-rocks in the South Seas; strictly marine. *Kuhlia arge* Jordan and Bollman from the Galapagos is probably the same.

Family LXIX. APOGONIDÆ⁴ (Cardinal-fishes).

PRISTIAPOGON Klunzinger.

Both limbs of preopercle serrate; gill-rakers numerous; dorsal spines usually seven; scales large; caudal fin lunate.

263. *Pristiapogon menesemus* (Jenkins). *Upapālu*. (J. & E., p. 215.)

Common about the reefs.

264. *Pristiapogon snyderi* (Jordan and Evermann). (J. & E., p. 214.)

Apogon frenatus Günther, *non* Cuvier and Valenciennes.

Common about Hawaii.

265. *Pristiapogon erythrinus* Snyder. (J. & E., p. 217.)

Rare about the reefs.

APOGON Lacépède.

(*Amia* Gronow, 1763, not binomial. Not *Amia* Linnæus, 1766.)

§ OSTORHYNCHUS Lacépède.

Like *Apogon* proper, but with seven or eight dorsal spines, instead of six; preopercle serrate on the posterior limb only; lateral line complete; scales large (about twenty-five); teeth on palatines; gill-rakers numerous; caudal fin more or less lunate, not convex.

266. *Apogon maculiferus* Garrett. (J. & E., p. 212.)

A handsome little fish, common behind the reefs.

LEPIDAMIA Gill.

267. *Lepidamia evermanni* (Jordan & Snyder). (J. & E., p. 213.)

(Proc. U. S. N. M., XXVIII, 1905, p. 123.)

One specimen known from Honolulu.

FOA Jordan and Evermann.

268. *Foa brachygramma* (Jenkins). (J. & E., p. 211.)

Scarce, on the reefs.

⁴ We may retain the name-*Apogon* until the question of the adoption of Gronow's non-binomial names, not validated by Scopoli in 1777, is finally settled.

APOGONICHTHYS Bleeker.

Preopercle entire; lateral line complete; teeth on palatines; gill-rakers numerous; caudal lunate.

269. *Apogonichthys waikiki* (Jordan and Evermann). (J. & E., p. 210.)

A rare little fish, found on the reefs.

SYNAGROPS Günther.

(*Melanostoma* Steindachner and Döderlein. Preoccupied.)

270. *Synagrops argyrea* (Gilbert and Cramer). (J. & E., p. 218; G., p. 618.)

Deep sea. Rare.

NOTE.

The genera or subgenera allied to *Apogon*, some of them of questionable value, are provisionally diagnosed in the following key:

- a. Jaws without distinct canine teeth.
 - b. Anal fin long, its rays about II, 16; preopercle entire; dorsal spines six; scales large, about twenty-five; caudal fin forked (*bleekeri*) ARCHAMIA Gill.
 - bb. Anal fin short, its rays usually II, 8.
 - c. Preopercle distinctly serrate on one or both limbs.
 - d. Caudal fin lunate or forked.
 - e. Preopercle distinctly serrate on both limbs; dorsal spines seven (*frenatus*).
PRISTIAPOGON.
 - ee. Preopercle serrate on posterior limb only.
 - f. Vomer and palatines with teeth.
 - g. Scales large, about twenty-five.
 - h. Dorsal spines six (*ruber*); (*Amia* Gronow; *Monoprion* Poey).
APOGON.
 - hh. Dorsal spines seven or eight (*fleurieu*) . . . OSTORHYNCHUS Lacépède.
 - gg. Scales small, thirty-five to fifty; dorsal spines six (*kalosoma*).
LEPIDAMIA Gill.
 - ff. Vomer and palatines toothless (*parvula*) BREPHAMIA⁵ Jordan.
 - dd. Caudal fin convex, its peduncle rather long; scales large; dorsal spines six (*fusca*).
NECTAMIA Jordan.
 - cc. Preopercle rigidly entire on both limbs.
 - i. Caudal fin rounded.
 - j. Dorsal fins not connected at base.
 - k. Palatines with teeth.
 - l. Lateral line complete.
 - m. Gill-rakers few and small, about six; profile before dorsal S-shaped, concave above eye; dorsal spines six.
 - n. Scales small, about forty; tongue with small teeth (*apron*).
GLOSSAMIA Gill.

⁵ BREPHAMIA *gen. nov.*, Jordan. Type *Amia parvula* Radcliffe. Differing from *Apogon* in having no teeth on vomer or palatines.

- nn.* Scales large, twenty-five to thirty-one (*lunatus*).
MIONORUS Krefft.
- mm.* Gill-rakers numerous, twelve to fourteen; profile even; dorsal spines seven.
- o.* Scales small, about forty-five (*pandionis*).
XYSTRAMIA Jordan.
- oo.* Scales large, about twenty-five (*perdix*).
APOGONICHTHYS Bleeker.
- ll.* Lateral line incomplete, imperfect or wanting on caudal peduncle. Gill-rakers numerous; dorsal spines seven (*brachygramma*).
FOA Jordan & Evermann.
- kk.* Palatines without teeth; lateral line incomplete; gill-rakers few, short; a large black ocellus on opercle (*aurita*) . . . FOWLERIA Jordan & Evermann.
- jj.* Dorsal fins joined at base; dorsal spines eight (*octospina*).
NEAMIA Smith & Radcliffe.
- ii.* Caudal fin lunate or forked; scales large; gill-rakers long and slender.
- p.* Lower teeth not enlarged; body much compressed, the back elevated; dorsal spines produced (*græffi*) ZORAMIA Jordan.
- pp.* Lower teeth enlarged; body not greatly compressed; dorsal spines six, not produced (*clupeoides*) RHABDAMIA Weber.
- aa.* Canine teeth present; teeth on palatines; anal fin short, its rays II, 8; lateral line complete; scales large, about twenty-five; caudal lunate.
- q.* Preopercle entire; dorsal spines six; body rather elongate (*lineatus*) . . CHEILODIPTERUS Lacépède.
- qq.* Preopercle more or less serrate; dorsal spines more than six.
- r.* Scales cycloid; dorsal spines about nine; gill-rakers numerous, about twelve.
- s.* Dorsal spines smooth; body more or less compressed (*japonica*) . . SYNAGROPS Günther.
- ss.* Dorsal spines anteriorly serrate (*serratospinosa*) MACCULLOCHINA⁶ Jordan.
- rr.* Scales ctenoid; dorsal spines seven.
- t.* Lateral line anteriorly with a conspicuous row of enlarged tubules; gill-rakers few and short (*tubifera*) SIPHAMIA Weber.
- tt.* Lateral line without enlarged tubules; gill-rakers numerous (*grossidens*).
AMIOIDES Smith & Radcliffe.

HYNNODUS Gilbert.

271. *Hynnodus atherinoides* Gilbert. (G., p. 618.)

Deep sea. Two specimens from Pailolo Channel.

SCEPTERIAS⁷ gen. nov. Jordan and Jordan.

Type *Scepterias fragilis* Jordan and Jordan. (*Vide infra*.)

Allied to *Epigonus* Rafinesque and *Hynnodus* Gilbert.

Body elongate, fragile, not so slender as in *Hynnodus*, but more so than in

⁶ MACCULLOCHINA *genus novum*. Type *Synagrops serratospinosa* Radcliffe, distinguished from *Synagrops* by the serrated dorsal spines. The name is proposed in honor of Mr. Allan Riverston McCulloch of the Australian Museum, one of the most accurate workers in systematic ichthyology now living.

⁷ From *σκεπτερίας* = *open-eyed*, *sceptical*.

Epigonus; the mouth larger and the fins higher; teeth small, subequal; pre-orbital narrow; maxillary narrow, naked, not slipping under preorbital; pores of lateral line simple; a weak spine on opercle, head otherwise unarmed; dorsal fins well separated, the first of seven slender spines, the second short, rather high, nearly opposite anal; anal with two feeble spines; caudal deeply forked; ventrals below pectorals; both fins rather long; ventral rays I, 5. Scales moderate, caducous.

This genus differs from *Hynnodus* in the deeper body, smaller scales, and higher fins. Both genera are plainly allied to *Epigonus* Rafinesque of the Mediterranean, and should constitute a subfamily, *Epigoninae*, within the *Apogonidae*.

272. *Scepterias fragilis* sp. nov. Jordan and Jordan. (Pl. II, fig. 2.)

Type No. 3900 Carnegie Museum. Honolulu. Coll. D. S. Jordan.

Head 3.33 in length; depth 4.75; eye 2.5 in head; snout 5.33; maxillary 2; dorsal rays VII, 1, 10; anal rays II, 9; scales 3-54-10.

Body elongate, the outlines relatively straight and parallel; head rather broad above, the profile even; mouth rather large, terminal, oblique; jaws equal; maxillary narrow, naked, reaching nearly to middle of pupil, the tip not slipping under the narrow preorbital; a row of small subequal teeth in each jaw, a patch on vomer, no teeth on palatines; preopercle entire, the rounded angle somewhat produced; cheeks scaly; opercle scaly, ending in a short weak spine; gill-rakers x^*+14 , rather long and very slender, about half diameter of eye; pseudo-branchiae large. Scales moderate, thin, readily falling; lateral line well developed, with large pores, concurrent with back, extending on caudal fin. Dorsal spines slender, the third rather the longest, a little more than half the head, first spine moderate, one-third length of the longest. Interspace between dorsals about one-third head; second dorsal higher than long, its first ray two-thirds head; caudal deeply forked, its lobes equal, pointed, two-thirds head; anal high, similar to soft dorsal, but inserted a little farther back; pectoral pointed, reaching front of soft dorsal, 1.33 in head; ventrals inserted just below pectorals, 2 in head. Substance soft and fragile.

Color plain dusky, paler below, without markings; scales with fine punctulations, inside of gill-cavity black. Length of type 4.6 inches.

Four specimens were found in the Honolulu market, apparently spewings of some large fish, perhaps *Epinephelus* or *Etelis*.

*The letter x indicates that the number is uncertain and not easily counted, as they dwindle into rudiments above.

Family LXX. SERRANIDÆ (Sea-bass).

PIKEA Steindachner.

273. *Pikea aurora* Jordan and Evermann. (J. & E., p. 220.)

A rare and very handsome species.

CEPHALOPHOLIS Bloch and Schneider.

274. *Cephalopholis argus* Bloch and Schneider. (J. & E., p. 221.)

A common fish in the South Seas, recorded but once from Hawaii by Quoy and Gaimard, and therefore perhaps doubtfully.

EPINEPHELUS Bloch.

This genus, abundant in both the East and West Indies, is very scantily represented in Hawaii.

275. *Epinephelus quernus* Seale. *Hapū'u pū'u*. (J. & E., p. 223.)

This large fish is now rather common in the markets of Hawaii.

ODONTANTHIAS Bleeker.

Of the *Serraninæ* none at all are found in the waters of Hawaii. The *Anthiine* forms are, however, well represented.

276. *Odontanthias fuscipinnis* (Jenkins). (J. & E., p. 225.)

Rather common at moderate depths.

PSEUDANTHIAS Bleeker.

277. *Pseudanthias kelloggi* (Jordan and Evermann). (J. & E., p. 226.)

Rare; found in rather deep water.

RHYACANTHIAS Jordan.

(Proc. U. S. N. M., 1921, p. 647.)

278. *Rhyacanthias carlsmithi* Jordan.

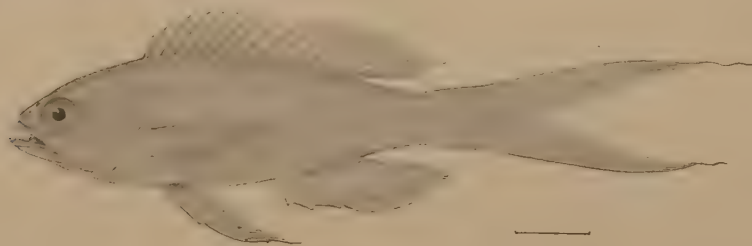


FIG. 3. *Rhyacanthias carlsmithi* Jordan. (Reproduced from Proc. U. S. N. M., Vol. 59, 1921, p. 647.)

From deep water, off the southwestern coast of Hawaii. The type killed by a lava-flow from Mauna Loa.

GRAMMATONOTUS Gilbert.

279. *Grammatonotus laysanus* Gilbert. (G., p. 619.)

Deep water, off Laysan.

Family LXXI. PRIACANTHIDÆ (Catalufas).

PRIACANTHUS Cuvier.

280. *Priacanthus alalaua* Jordan and Evermann. *Alalaua*. (J. & E., p. 228.)

Rather scarce.

281. *Priacanthus cruentatus* (Lacépède). *Aweoweo*. (J. & E., p. 229.)

Very abundant. The Pacific form, *Priacanthus carolinus* Lesson, needs further comparison with the West Indian *P. cruentatus* with which we have hitherto identified it.

282. *Priacanthus meeki* Jordan and Evermann. *Ulalauau*. (J. & E., p. 231.)

Abundant. A food-fish of some importance. Near *Priacanthus hamruhr* Forskål of the Red Sea.

Family LXXII. EMMELICHTHYIDÆ.

ERYTHROCLES Jordan.

(*Erythrichthys* Temminck and Schlegel, name preoccupied.)

283. *Erythrocles scintillans* Jordan and Thompson. (Proc. U. S. N. M., XLI, 1912, p. 599.) (J. & E., p. 245.)

Rather scarce. This beautiful fish differs somewhat from its Japanese congener, *Erythrocles schlegeli*. The genus *Erythrocles* is close to *Emmelichthys* Richardson, but probably distinct. *Boaxodon cyanescens* from Chile, having a broad scaly maxillary, is closely related, but *Inermia vittata* from the West Indies and *Dipterygonotus leucogrammicus* from the East Indies cannot be placed in the same family, having the maxillary narrow and naked.

Family LXXIII. HISTIOPTERIDÆ.

HISTIOPTERUS Temminck and Schlegel.

284. *Histioporus typus* Bleeker.

A cast of a fine specimen of this large fish, otherwise only known from Japan, is in the Bishop Museum.

Family LXXIV. LUTIANIDÆ (Snappers).

All the Hawaiian species of this family belong to the aberrant group of *Etelinæ*, distinguished in several ways from the typical members of the family, but especially by the scaleless dorsal and anal fins; and most of them by the broad flattish cranium.

ROOSEVELTIA Jordan and Evermann.

In this genus the body is relatively deep, the canines strong, the tongue toothless, and the pectoral falcate. The typical species was at first referred to *Serranus* Cuvier, to which genus it bears little resemblance, and afterwards to *Apsilus* Cuvier, to which it is closely related.

285. *Rooseveltia brighami* (Seale). *Ukikiki; Kalikali*. (J. & E., p. 233.)

This beautiful fish, one of the handsomest found in Hawaii, light crimson in color, marked with three broad golden cross-bands, is now common in the markets, as the Japanese fishermen operate in deeper water than the Hawaiians, whom as fishermen they have now succeeded.

286. *Rooseveltia aloha* Jordan and Snyder.

Known only from the original type.

PRISTIPOMOIDES Bleeker.

(*Platyinius* Gill (*vorax* = *macrophthalmus*); *Bowersia* Jordan & Evermann.)

We are unable to separate the Hawaiian species, called *Bowersia*, from the East Indian genus *Pristipomoides*. The only difference of any importance is in the slenderer body of the Hawaiian species. The West Indian form called *Platyinius* is equally close, the body being a little deeper than in either of the others. *Pristipomoides sparus* and *P. microlepis* seem to be genuine members of this genus.

Sparopsis Kner, referred to the synonymy of *Pristipomoides* by Bleeker, belongs to the *Denticinæ* and to the genus or subgenus *Synagris* (*Anemura* Fowler) allied to *Nemipterus*. *Pristipomoides* has canines in both jaws; no filamentous spines; no teeth on tongue; last ray of dorsal and of anal elongate; pectoral long, falcate; scales relatively large, about sixty. This genus and the next are offshoots from *Aprion*, to which both are closely related. The account of the teeth of *Bowersia violescens* by Jordan and Evermann is not correct, as the tongue is toothless.

287. *Pristipomoides violescens* (Jordan and Evermann). *Opakapaka*. (J. & E., pp. 234, 236.)

Apsilus microdon, as described by Jordan and Evermann, is the young of this species. Steindachner's fish was, however, *Ulaula sieboldi*.

ULAULA Jordan and Thompson.

(Jordan and Thompson, Proc. U. S. N. M., XXXIX, 1911, p. 439. Type *Bowersia ulaula* Jordan and Evermann = *Chaetopterus sieboldi* Bleeker, the name *Chaetopterus* preoccupied.)

In this group, or subgenus, there are no canines; tongue with small teeth; pectoral falcate; mouth small. The name *Ulaula*, meaning "very red," belongs properly to *Etelis evurus*.

288. *Ulaula sieboldi* (Bleeker). *Kod'e*. (J. & E., p. 237.)

(*Aprion microdon* Steindachner.)

This, like the preceding and the next two species, is a common food-fish of Hawaii, and, having the same olive-gray color with purplish reflections, they are often confused in the markets. We are not able to distinguish the Hawaiian form *U. microdon* (Steindachner) from Japanese specimens of *U. sieboldi* = *Chaetopterus dubius* Günther.

APRION Cuvier and Valenciennes.

Canines present; no teeth on tongue; pectorals very short; body elongate; scales large. The synonymy of this genus, as given by Jordan and Evermann, contains several errors.

289. *Aprion virescens* Cuvier and Valenciennes. *Uku*. (J. & E., p. 239.)

This species, one of the most abundant and highly valued of the Hawaiian food-fishes, reaches a much larger size than the three just mentioned, attaining a length of three feet or more.

ETELINUS Jordan and Thompson.

(Jordan and Thompson, Proc. U. S. N. M., XXXIX, 1911. Type *Etelis marshi* Jenkins.)

This genus has the notched dorsal and crimson colors of *Etelis* with the general form and dentition of *Pristipomoides*. The resemblance of the genus to the Japanese *Döderleinia* is extremely close, although the latter, having a broad scaly maxillary, not slipping under the preorbital, must be placed in a different family in or near the *Serranidae*.

290. *Etelinus marshi* (Jenkins.) *Ūlaūla*. (J. & E., p. 240.)

A common and valued food-fish.

ETELIS Cuvier and Valenciennes.

Body elongate; dorsal deeply notched; caudal broadly forked; pectoral rather short; canines present; no teeth on tongue. Color deep crimson.

291. *Etelis evurus* Jordan and Evermann. *Ulaula*. (J. & E., p. 242.)

This superb species, reaching a length of three feet, is now common in the markets, being taken in rather deep water. It is close to the West Indian *Etelis oculatus* and needs further comparison with *Etelis carbunculus* of the Île de France.

The genera of the *Etelinæ* have been much confused and misunderstood. They may be defined as follows:

- a. *ETELINÆ*. Cranium solid; skeleton firm; dorsals connected; soft dorsal and anal scaleless; last ray of dorsal and anal more or less produced; scales above lateral line in rows parallel with the lateral line.
- b. Dorsal fin continuous, not deeply notched or divided.
 - c. Cranium not flat above, much as in *Lutianus*; the interorbital area not separated from the occipital region, the median and lateral crests procurent on it; frontal narrowed anteriorly; body rather deep.
 - d. Canines none. Tongue with small teeth.
 - e. Pectoral fins very short, shorter than ventrals; color dull olivaceous (*fuscus*).

APSIUS.
 - ee. Pectoral fins rather long, falcate (*macrophthalmus*) TROPIDIUS.
 - dd. Canine teeth well developed; no teeth on tongue; skull thick, with three blunt ridges separated by narrow grooves; color red and golden (*brighami*) ROOSEVELTIA.
 - cc. Cranium flat above, much as in *Etelis*; the interorbital area separated from the occipital region by a transverse line of demarcation, the median and lateral crests not procurent on it; frontal broad anteriorly.
 - f. Pectoral fin long, falcate.
 - g. Canine teeth present; no teeth on tongue (*typus*) PRISTIPOMOIDES.
 - gg. Canine teeth obsolete; tongue with a patch of very small teeth (*sieboldi*) ULAULA.
 - ff. Pectoral fin short, not falcate, formed as in *Apsilus*; body elongate; preorbital very broad (*virescens*) APRION.
 - bb. Dorsal fin divided or deeply notched; cranium broad, flattish, the median and lateral crests not procurent on it; color red.
 - h. Maxillary scaly; body elongate; canines strong.
 - i. Caudal fin moderately forked; gill-rakers rather few (*marshi*) ETELINUS.
 - ii. Caudal fin deeply forked, the lobes produced; gill-rakers slender, numerous (*carbunculus*) ETELIS.
 - hh. Maxillary naked; body compressed; canines none; gill-rakers slender (*aquilionaris*).

ETELIDES.
 - aa. *VERILINÆ*. Cranium cavernous; skeleton soft; form not elongate; dorsal divided to its base; second dorsal scaly at base; color black; deep-sea forms (*sordidus*) VERILUS.

The Japanese genus *Döderleinia* (*Eteliscus* Jordan and Snyder) must stand very near to the *Anthiinae*. The genus *Verilus* Poey, a deep-sea form, black in color, with cavernous skull and soft skeleton, should constitute a distinct subfamily, *Verilinae*, allied to the *Etelinae*. The dorsal fin is divided into two, and the second dorsal is scaly at the base.

Family LXXV. APHAREIDÆ.

This family, allied to the *Lutianidæ* and especially to the *Etelinæ*, differs in having no teeth on vomer or palatines; those of the jaws are very small.

APHAREUS Cuvier and Valenciennes.

292. **Aphareus furcatus** Cuvier and Valenciennes. (J. & E., p. 235.)

Aphareus flavivultus Jenkins.

This species seems to be widely distributed, but nowhere common. The type of *A. flavivultus* had the top of the head and forehead bright yellow, the fish being otherwise dull brownish purple. Our specimens do not show the yellow, which fades in spirits.

Family LXXVI. SPARIDÆ (Porgies).

MONOTAXIS Bennett.

(*Sphærodon* Günther.)

293. **Monotaxis grandoculis** (Forskål). *Mu*; *Mamamu*. (J. & E., p. 243.)

Rather common.

Family LXXVII. KYPHOSIDÆ (Rudder-fishes).

KYPHOSUS Lacépède.

294. **Kyphosus elegans** (Peters). *Nenue paivi*. (J. & E., p. 247.)

Kyphosus sandvicensis (Sauvage).

Not rare about Honolulu. It seems to be identical with *Kyphosus elegans* (Peters) from Mazatlan.

295. **Kyphosus fuscus** (Lacépède). *Manaloa*; *Nenue*. (J. & E., p. 248.)

Not rare at Honolulu.

SECTATOR Jordan and Fesler.

296. **Sectator azureus** Jordan and Evermann. (J. & E., p. 248.)

A beautiful fish, of which but one specimen is as yet known. Unknown to the fishermen.

Family LXXVIII. MULLIDÆ (Surmulletts).

MULLOIDES Bleeker.

297. **Mulloidides auriflamma** (Forskål). *Weke ula*. (J. & E., p. 250.)

Rather common.

298. **Mulloidides erythrinus** Klunzinger. (J. & E., p. 251.)

Recorded from Laysan Island.

299. *Mulloides pflugeri* Steindachner. *Weke ula ula*. (J. & E., p. 251.)

Now rather common in the markets. *Mulloides flammeus* Jordan and Evermann is probably the young of this species.

300. *Mulloides samoënsis* Günther. *Weke; Weke a'a*. (J. & E., p. 253.)

Not rare about Honolulu

301. *Mulloides preorbitalis* (Smith and Swain). (J. & E., p. 264.)

Johnston Island. Occasional at Honolulu.

302. *Mulloides vanicolensis* (Cuvier and Valenciennes). (J. & E., p. 254.)

South Seas. Recorded from Johnston Island.

UPENEUS Cuvier.

(*Pseudupeneus* Bleeker.)

303. *Upeneus porphyreus* (Jenkins). *Kumu*. (J. & E., pp. 261-262.)

The largest species of the genus, constantly in the markets, and justly highly valued as food. Teeth very small; barbel short; characters which give the appearance of *Mulloides*. The specimen from Honolulu, recorded by Steindachner as *U. fraterculus*, is probably *U. porphyreus*.

304. *Upeneus chryserydros* (Lacépède). *Moana kea*. (J. & E., p. 255.)

Not rare at Honolulu.

305. *Upeneus multifasciatus* (Quoy and Gaimard). *Moana*. (J. & E., p. 256.)

Very common in the markets, but apparently limited to the Hawaiian Islands; replaced in Polynesia by *U. moana* Jordan and Seale, a very similar species.

306. *Upeneus bifasciatus* Lacépède. *Munu*. (J. & E., p. 258.)

Rather common about Honolulu.

307. *Upeneus chrysonemus* (Jordan and Evermann). (J. & E., p. 258.)

Common. Known by the yellow barbels.

308. *Upeneus crassilabris* (Cuvier and Valenciennes). (J. & E., p. 259.)

South Seas. Found at Johnston Island.

309. *Upeneus pleurostigma* (Bennett). (J. & E., p. 260.)

Common about Honolulu.

UPENEOIDES Bleeker.

(*Upeneus* Bleeker, not of Cuvier, as restricted by the first reviser.)

310. *Upeneoides arge*⁸ (Jordan and Evermann). *Weke puéo; Weke pahūla*. (J. & E., p. 264.)

Very abundant; close to *Upeneus vittatus* of the South Seas.

⁸ *Upeneoides taniopterus* (Cuvier and Valenciennes), an Indian species, was recorded from Honolulu by Steindachner, who mistook for it the young of *U. arge*.

Family LXXIX. MALACANTHIDÆ.

MALACANTHUS Cuvier.

311. **Malacanthus parvipinnis** Vaillant and Sauvage. *Maká'a*. (J. & E., p. 275.)
Common about Honolulu.

Suborder CIRRHITIFORMES.

Family LXXX. CHEILODACTYLIDÆ.

GONIISTIUS Gill.

This genus differs from *Cheilodactylus* mainly in the number of fin-rays (D. XVII, 27-32; A. III, 8: instead of D. XVIII, 23; A. III, 11). The outline of the dorsal is much more strongly angulated.

312. **Goniistius vittatus** (Garrett). *Kikakāpu*. (J. & E., p. 447.)

Two fine specimens of this very rare species were found by us in the Honolulu market. The name *vittatus* is ill-suited to the broad, oblique, black cross-bands, which are characteristic of this species.

Family LXXXI. CIRRHITIDÆ.

CIRRHITOIDEA Jenkins.

313. **Cirrhitoides bimacula** Jenkins. (J. & E., p. 448.)
Rare.

PARACIRRHITES Bleeker.

314. **Paracirrhites cinctus** (Günther). *Pilikó'a; Póopa'a; Oopuka-hai-hai*. (J. & E., p. 449.)
Very common.

315. **Paracirrhites forsteri** (Bloch and Schneider). *Hilupilikoa*. (J. & E., p. 450.)
Abundant.

316. **Paracirrhites arcatus** (Cuvier and Valenciennes). *Pilikó'a*. (J. & E., p. 450.)
Very abundant. We have no explanation of the two patterns of coloration; about half of the specimens having a broad, well-defined white stripe along the back posteriorly, while in others, similarly colored, this is absent.

CIRRHITUS Lacépède.

317. **Cirrhitus marmoratus** (Lacépède). *Pó'opá'a; Oópukái*. (J. & E., p. 452.)
Abundant; large enough to acquire importance as a food-fish.

Suborder *PAREIOPLITÆ*.*(Loricati.)*

Family LXXXII. CARACANTHIDÆ.

CARACANTHUS Krøyer.

- 318.
- Caracanthus maculatus*
- (Gray). (J. & E., p. 453.)

Scarce; about the reefs.

AMPHIPRIONICHTHYS Bleeker.

This genus differs from *Caracanthus* in having the dorsal fins fully united.

- 319.
- Amphiprionichthys unipinna*
- (Gray). (J. & E., p. 454.)

A rare fish of the reefs.

Family LXXXIII. SCORPÆNIDÆ (Scorpion-fishes; Rock-cod).

SEBASTAPISTES Gill.

- 320.
- Sebastapistes ballieui*
- (Sauvage).
- Poopa'a*
- . (J. & E., p. 455.)

Rather common.

- 321.
- Sebastapistes corallicola*
- Jenkins. (J. & E., p. 455.)

Three specimens known.

- 322.
- Sebastapistes asperella*
- (Bennett). (J. & E., p. 458.)

Not recognized since recorded by Bennett.

- 323.
- Sebastapistes coniota*
- Jenkins. (J. & E., p. 458.)

Common on the reefs.

- 324.
- Sebastapistes galactacma*
- Jenkins. (J. & E., p. 459.)

Common on the reefs.

- 325.
- Sebastapistes coloratus*
- Gilbert. (G., p. 627.)

Off Molokai, in deeper water.

SCORPÆNODES Bleeker.

(Sebastopsis Gill, and likewise Sauvage.)

- 326.
- Scorpænodes kelloggi*
- (Jenkins). (J. & E., p. 462.)

Common on the reefs.

- 327.
- Scorpænodes parvipinnis*
- (Garrett). (J. & E., p. 463.)

Very rare.

HELICOLENUS Goode and Bean.

- 328.
- Helicolenus rufescens*
- Gilbert. (G., p. 631.)

Off Kauai, in deep water.

PONTINUS Poey.

329. *Pontinus spilistius* Gilbert. (G., p. 633.)
Off Maui.

MERINTHE Snyder.

330. *Merinthe macrocephala* (Sauvage). *Oopu kai Nohu*. (J. & E., p. 461.)
A beautiful fish, reaching a weight of about six pounds, now common in the markets, being taken in rather deep water.

SETARCHES Johnson.

331. *Setarches remiger* Gilbert and Cramer. (G., p. 634.)
Common in deep water.

PLECTROGENIUM Gilbert.

332. *Plectrogenium nanum* Gilbert. (G., p. 634.)

SCORPÆNOPSIS Heckel.

333. *Scorpænopsis gibbosa* (Bloch and Schneider). *Nóhu; Omakaha*. (J. & E., p. 468.)
Scorpænopsis catocala Jordan and Evermann.
Abundant; known by the variegated breast.
334. *Scorpænopsis cacopsis* Jenkins. (J. & E., p. 467.)
Not rare.
335. *Scorpænopsis altirostris* Gilbert. (G., p. 628.)
Off Molokai. Perhaps type of a distinct genus, the head not being depressed as in *Scorpænopsis*, and the general appearance more like that of *Sebastapistes*.

PELOROPSIS Gilbert.

336. *Peloropsis xenops* Gilbert. (G., p. 630.)
Avan Channel between Maui and Lanai.

IRACUNDUS Jordan and Evermann.

337. *Iracundus signifer* Jordan and Evermann. (J. & E., p. 470.)
A rare fish of the coral-reefs. But two specimens are known.

TÆNIANOTUS Lacépède.

338. *Tænianotus garretti* Günther. (J. & E., p. 471.)
Known only from a drawing.
339. *Tænianotus citrinellus* Gilbert. (G., p. 636.)
Off Molokai.

BRACHIRUS Swainson.

Dendrochirus Swainson. Unfortunately *Brachirus* has priority. Later Swainson transferred the name *Brachirus* to a genus of Soles.

Pectorals with the upper rays branched.

340. *Brachirus barberi* (Steindachner). (J. & E., p. 465.)

Dendrochirus hudsoni Jordan and Evermann.

341. *Brachirus chloreus* Jenkins. (J. & E., p. 465.)

Occasional about the coral-reefs.

PTEROIS Cuvier.

342. *Pterois sphex* Jordan and Evermann. (J. & E., p. 464.)

Taken but once at Honolulu.

Family LXXXIV. BEMBRADIDÆ.

BEMBRADIUM Gilbert.

343. *Bembradium roseum* Gilbert. (G., p. 637.)

Deep water; Pailolo Channel.

Family LXXXV. PERISTEDIIDÆ.

PERISTEDION Lacépède.

344. *Peristedion engyceros* Günther.

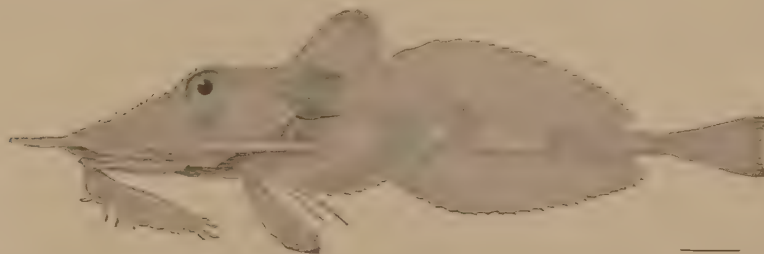


FIG. 4. *Peristedion engyceros* Günther. (Reproduced from Jordan, Proc. U. S. N. M., Vol. 59, 1921, p. 654.)

Rare, in deep water. Besides the original type, found half-dried on the beach, we have found one specimen from the deep sea and one killed in a lava-flow from Mauna Loa. There is also a cast in the Bishop Museum. The species may be distinguished from the next by the divergence of the long proboscideal horns and by the presence of dark cross-bands.

345. *Peristedion gilberti* Jordan. (G., p. 639.)

(Proc. U. S. N. M., LIX, 1921, p. 655, *Peristedion engyceros* Gilbert, not of Günther.)



FIG. 5. *Peristedion gilberti* Jordan. (C. M. No. 3895.)

Horns rigidly parallel; color red, often with small round olive spots. Found in the deep sea, abundantly in places.

346. *Peristedion hians* Gilbert and Cramer. (G., p. 638.)

Frequent in deep water.

Family LXXXVI. HOPLICHTHYIDÆ.

HOPLICHTHYS Cuvier and Valenciennes.

347. *Hoplichthys citrinus* Gilbert. (G., p. 640.)

Deep sea; abundant.

348. *Hoplichthys platophrys* Gilbert. (G., p. 642.)

Deep sea off Laysan; only one specimen known.

Family LXXXVII. CEPHALACANTHIDÆ (Flying Gurnards).

(*Dactylopteridæ*.)

DACTYLOPTENA Jordan and Richardson.

(Proc. U. S. N. M., XXXIII, 1909, p. 665.)

349. *Dactyloptena orientalis* (Cuvier and Valenciennes). *Lolo-oau*. (J. & E., p. 473.)

Rather scarce. We are thus far unable to separate the Hawaiian Flying Gurnard from the common Japanese species. The description of this species by Jordan and Richardson, *l. c.*, is from examples from Hilo.

Suborder *SQUAMIPENNES*.

Family LXXXVIII. CAPROIDÆ.

ANTIGONIA Lowe.

350. *Antigonia steindachneri* Jordan and Evermann. (J. & E., p. 361; G., p. 621.)

A Japanese fish, rarely seen about Hawaii in deep water.

351. *Antigonia eos* Gilbert. (G., p. 621.)

Deep sea; Pailolo Channel.

Family LXXXIX. CHÆTODONTIDÆ (Butterfly-fishes).

FORCIPIGER Jordan and McGregor.

352. *Forcipiger longirostris* (Broussonet). (J. & E., p. 363.)

Forcipiger flavissimus Jordan and McGregor.

Rather common in the markets. In the plate published by Jordan and Evermann the brilliant yellow of this curious fish is not well represented.

CHÆTODON Linnæus. Kihi kihi.

(*Tetragonopterus* Bleeker.)

This genus covers a great variety of species agreeing in general form and in bright coloration, mainly yellow with black cross-bands or markings. It may perhaps be divisible into several genera, the division being based on the direction of the lines of scales, the size of the scales, and the form of the head. At present the subgenera, as proposed by Kaup and by Bleeker, are too ill-defined to permit of their recognition as genera. In the typical section of *Chætodon* (type *Chætodon capistratus* Linnæus), which is not represented in Hawaii, the lines of scales above the lateral line extend upward and backward, those below downward and backward, and none of the dorsal rays are prolonged.

§ LINOPHORA Kaup.

(One of the dorsal rays prolonged, whip-like, otherwise essentially as in *Chætodon* proper.)

353. *Chætodon setifer* Bloch. *Kihi-kihi; Kikakāpu*. (J. & E., p. 364.)

Common in Hawaii.

§ OXYCHÆTODON Bleeker.

(Scales of sides enlarged; snout sharp; a projection before eye.)

354. *Chætodon lineolatus* Cuvier and Valenciennes. (J. & E., p. 365.)

Rather rare.

§ CHÆTODONTOPS Bleeker.

(Scales of sides moderately enlarged; snout moderate;
profile even, no convexity before eye.)

355. *Chætodon lunula* (Lacépède). *Kikakápu*. (J. & E., p. 366.)

Very common. The young have higher fins and a black dorsal ocellus.

§ LEPIDUCHÆTODON Bleeker.

(Scales of sides anteriorly much enlarged, the rows nearly horizontal;
teeth large; snout short; profile steep.)

356. *Chætodon unimaculatus* Bloch. *Kikikápu*. (J. & E., p. 368.)

Chætodon sphenospilus Jenkins.

Not rare about the reefs.

§ CITHARÆDUS Kaup.

(Snout short and blunt; scales moderate, the rows nearly horizontal.)

357. *Chætodon ornatissimus* Solander. *Kikikápu*. (J. & E., p. 373.)

Rather rare; about the reefs.

358. *Chætodon punctatofasciatus* Cuvier and Valenciennes. (J. & E., p. 369.)

Not rare.

§ RABDOPHORUS Kaup.

(Scales subequal, moderate, arranged in series mostly horizontal, those above
lateral line much reduced in size; snout rather short.)

359. *Chætodon ephippium* Cuvier and Valenciennes.

A common and showy species of the South Seas, once found in the Honolulu market.

360. *Chætodon fremblii* Bennett. (J. & E., p. 375.)

A handsome, but rather rare species.

361. *Chætodon trifasciatus* Mungo Park. (J. & E., p. 372.)

A Polynesian species, rather rare at Honolulu. The colored plate of Jordan and Evermann is from a Samoan example. This species and the next have rather large scales (forty, instead of fifty to sixty), thus approaching the next genus.

362. *Chætodon miliaris* Quoy and Gaimard. (J. & E., p. 371.)

Chætodon mantelliger Jenkins.

Generally common. The smallest species.

363. *Chætodon quadrimaculatus* Gray. (J. & E., p. 373.)

Rather common about Honolulu.

TIFIA gen. nov. Jordan.

Type *Chaetodon corallicola* Snyder.

This group is distinguished from *Rabdophorus* by the very large scales above as well as below the lateral line, about thirty in a lengthwise series, and arranged in nearly horizontal rows. Teeth very small; snout moderately acute; the profile straight. The name *Tifi-tifi* (*Kihi-kihi* in Hawaiian) is applied to all species of *Chaetodon* throughout the South Seas. The verb *tifi* is to adorn, and the name is given to the horns of the moon, the tips of the wing of a bird, and the like,

364. *Tifia corallicola* (Snyder). (J. & E., p. 374.)

Rare. Found in rather deep water.



FIG. 6. *Loa excelsa* Jordan. (Reproduced from Proc. U. S. N. M., Vol. 59, 1921, p. 653.)

LOA Jordan.

Scales small, even, the rows nearly horizontal; the first dorsal nearly scaleless, its first three spines thickened, the third and fourth very high.

365. *Loa excelsa* Jordan.

(Jordan, Proc. U. S. N. M., LIX, 1921, p. 652, fig. 6.)

Known from a single small specimen killed in a lava-flow from Mauna Loa in rather deep water. This young fish bears some resemblance to the young of *Chaetodon lunula* figured by Jordan and Evermann, but the dorsal spines are much longer and larger and the black markings are different.

MICRACANTHUS⁹ Swainson.

Dorsal and anal fins with few rays (D. XI, 17; A. III, 14). Scales small, about sixty.

366. *Micracanthus strigatus* (Cuvier and Valenciennes). (J. & E., p. 376.)

A Japanese fish, occasionally taken at Honolulu.

HENIOCHUS Cuvier and Valenciennes.

(*Diphreutes* Cantor, there being an earlier genus *Henioche*.)

367. *Heniochus macrolepidotus* (Linnæus). (J. & E., p. 376.)

Chaetodon acuminatus Linnæus, this name having two pages priority, but the later and most frequently employed name is preferred by the International Commission of Nomenclature.

A common fish of the Pacific, but rather rare at Honolulu.

HOLACANTHUS Lacépède.

None of the Hawaiian species are at all closely related to the type of this genus, *Holacanthus tricolor*, of the West Indies. In the typical group the scales are of moderate size; the lobes of the lunate caudal fin produced in long streamers. The numerous species of the South Seas need to be critically compared before the several subgenera proposed by Bleeker can be fully defined.

CHÆTODONTOPLUS Bleeker.

(Scales small; caudal fin rounded; suborbital entire;
scales above lateral line small.)

368. *Chætodontoplus bicolor* (Bloch). (J. & E., p. 380.)

Common in Polynesia; recorded by Günther from Hawaii.

⁹ Misprinted *Microcanthus* by Swainson.

369. *Chætodontoplus arcuatus* (Gray). (J. & E., p. 378.)

Described in 1831 from Honolulu, but only the type is as yet known.

CENTROPYGE Kaup.

Caudal rounded; scales large above as well as below lateral line, thirty to forty in a series; suborbital more or less serrate behind, but without strong spine. The original type of the genus, *Holacanthus tibicen*, was originally described as having four anal spines. Species of small size and variegated coloration.

370. *Centropyge potteri* (Jordan and Metz). (Pl. III, fig. 1.)

Holacanthus potteri Jordan and Metz, Proc. U. S. N. M., XLII, 1912, p. 525.

Only the type of this dainty species of the reefs was known, until the senior author secured four additional examples from the reef at Honolulu. The largest of these, differing in certain minor respects from the original type, is figured on Plate III, fig. 1.

The serrations on the preorbital and preopercle are larger than in the type; the cross-streakings somewhat different. The black blotches above the pectoral have disappeared, and the posterior part of the body is suffused with deep inky purple, almost black, a color which obscures the vermiculations, although these can be traced. In life the dark streaks were dark bluish purple, the paler colors a rich light orange.

371. *Centropyge tutuilæ* sp. nov. Jordan and Jordan. (J. & E., p. 378, Pl. LVI, not description.) (Pl. III, fig. 2.)

Holacanthus bispinosus Günther, Fische der Südsee, II, 1874, p. 51, Pl. LVI, fig. C. Description in part. Not *Holacanthus bispinosus* Günther, Cat. Fishes, II, 1860, p. 48, which is based on Bleeker's description of *Holacanthus diacanthus* from Amboyna.

Holacanthus bispinosus Jordan and Evermann, Fishes of Hawaii, Pl. LVI, not description, which was taken from two specimens of *Centropyge diacantha*.

Type: No. 3902 Carnegie Museum. Three inches long. Tutuila, Samoa; paratype, No. 8750, Stanford University.

Head 4; depth 1.75; eye 3.5 in head; snout 4.25; maxillary 4.25; dorsal rays XIV, 17; anal rays III, 15; scales 35, 18; the number of fin-rays can not be exactly counted, nor the number of scales, as on the caudal peduncle these grow very small.

Body broadly ovate, evenly rounded, the steep profile somewhat gibbous over the eye. Preorbital narrow, with two rather strong, blunt teeth; vertical line of

preopercle with small serræ; angle with a stout curved spine reaching nearly to base of pectoral; a sharp spine about one fifth as long just below it.

Scales on sides large, those above lateral line much smaller, merging into the scaly sheath of the dorsal fin; scales on belly much smaller; lateral line ending below last ray of dorsal; dorsal and anal scaly almost to their tips. Dorsal and anal rather high; the tips angular, reaching beyond base of the rounded caudal; ventrals filamentous, almost reaching front of anal, as long as head; pectorals a little shorter.

The colors in life, as correctly stated by Jordan and Seale, "Fishes of Samoa," p. 348, are as follows:

Ground-color deep orange, or copper-red, clearer below; the head, back, and vertical fins blue-black, the color forming about eighteen narrow cross-streaks on side as wide as the ground-color; breast and belly orange; the lips and spines violet; lower lip very bright blue; anal and dorsal edged with blue; caudal with a broader blue stripe inside the margin; pectoral yellow, dusky at base; ventral orange, edged with blackish in spines, coppery red, more or less faded, with about twenty vertical black cross-bars a shade wider than the interspaces, which are about equal to the pupil; breast plain light orange, bars growing irregular below; without distinct markings; dorsal, anal, and caudal black, unmarked (dorsal and anal figured by Günther with small blue spots); pectorals and ventrals pale, the ventral filament edged with black.

This handsome little fish has had a rather unfortunate fate in the synonymy. It was first noticed by Günther ("Fische der Südsee," II, p. 51, Tafel LVI), under the name of *Holacanthus bispinosus*, a name originally given by Günther to a specimen described by Bleeker from Amboyna under the erroneous name of *Holacanthus diacanthus*. But Bleeker's fish and the present one, as shown by Bleeker's figure, differ in color and in the armature of the preopercle. The true *bispinosus*, as figured, has much stronger spines on the lower limb of the preopercle, and the suborbital is very strongly serrate. The color is also very different, being yellow, with regular brown cross-bands, the caudal pale. Günther claims to have had specimens in the British Museum from the New Hebrides, and one, in bad condition, from Hawaii, collected by Garrett. Presumably his figure, which represents, but none too well, our *Centropyge tutuilæ*, was drawn from a New Hebrides example, colored after a sketch made by Parkinson in Tahiti.

The only Hawaiian record is that of Günther, mentioned above. Two specimens were obtained by Jordan and Kellogg at Pago Pago, Tutuila. One of these is the type of *Centropyge tutuilæ*, and served also for the colored plate drawn by

Morita and published by Jordan and Evermann under the name of *Holacanthus bispinosus*. But the description published by Jordan and Evermann ("Fishes of Hawaii," p. 378) was not taken from this species, but through some error, for which I cannot at present account, from two Samoan examples of *Centropyge diacantha* (Bloch).

It is not clear that Günther's description ("Fische der Südsee") belongs to the fish figured by him.

Centropyge tutuilæ is, therefore, until now known only from two colored plates, the first that of Günther, indifferent in quality, the other that of Morita, which is excellent.

In Samoa this species is known as *Tuu'u pulepule mumu* = broad fish, red-striped.

XIPHYPOPS¹⁰ gen. nov. Jordan.

Type: *Holacanthus fisheri* Snyder. Distinguished by the presence of two strong spines besides smaller serræ on the suborbital bone. The preopercle is also strongly armed. Scales large, those above the lateral line scarcely reduced; caudal rounded; profile convex; fourteen dorsal spines.

372. *Xiphyrops fisheri* (Snyder). (J. & E., p. 379.)

A handsome fish, taken a few times in rather deep water.

Family XC. ZANCLIDÆ (Moorish Idols).

ZANCLUS Cuvier and Valenciennes.

373. *Zanclus cornutus* (Linnæus). *Kihikihi*. (J. & E., p. 382.)

Very common about the reefs. *Zanclus canescens* Linnæus is thought by Bleeker to be a distinct species, having a spine on the preorbital and no black markings before the eye. It may be, as the writer has supposed, the young of the common *Zanclus cornutus*. The name *canescens* has one page priority over *cornutus*.

374. *Zanclus ruthiæ* Bryan.

(Bryan, Report Bernice Pauahi Bishop Museum, II, 1905, p. 22, fig. 2 (1906).)

A single young specimen taken at Honolulu, two and three-quarters of an inch long, remarkable for the great height of the first dorsal rays. The color is quite unlike that of *Z. cornutus*, young or old, there being only a faint dark bar across the interorbital and a broad obscure dark shade across body from dorsal to anal, and another on caudal peduncle. Caudal mostly black, as are the long rays of dorsal and the front of the anal and ventrals; lips black; tip of caudal pale; profile very steep; depth nearly equal to length. D. VII, 38; A. III, p. 33.

¹⁰ ξίφος = sword; ὑπο = below; ὤψ = eye.

Family XCI. ACANTHURIDÆ (Surgeon-fishes).

ACANTHURUS Forskål.

(*Hepatus* Gronow, 1763, non-binomial.)(*Teuthis* Linnæus, 1766, as restricted by Gill and other authors.¹¹)

375. *Acanthurus achilles* Shaw. *Pa kui kui*. (J. & E., p. 384.)

Common. A strikingly colored species.

376. *Acanthurus olivaceus* Bloch and Schneider. *Nae-nae*. (J. & E., p. 385.)

Common. Remarkable for the white stripe above the pectoral.

377. *Acanthurus leucopareius* Jenkins. *Maikoiko*. (J. & E., p. 386.)

Occasionally seen at Honolulu. Known by the white bar across nape and opercle.

378. *Acanthurus matoides* Cuvier and Valenciennes. *Maii; Walu*. (J. & E., pp. 387-389.)

Acanthurus xanthopterus Cuvier and Valenciennes.

Acanthurus blochii Cuvier and Valenciennes.

Teuthis guntheri Jenkins.

Common in the South Seas, rather rare at Honolulu. A dull-colored species with four dark streaks along dorsal and anal. Base of caudal with a pale ring.

379. *Acanthurus umbra* (Jenkins). (J. & E., p. 387.)

A dull-colored species. Rather common. The dorsal and anal plain; base of caudal whitish.

380. *Acanthurus elongatus* (Lacépède). *Mai'i*. (J. & E., p. 389.)

South Seas; occasional about the Hawaiian Islands. Dull-colored; the lips blackish; last rays of dorsal and anal black at base; body elongate. The Hawaiian form was described by Cuvier and Valenciennes under the name *Acanthurus nigros*.

381. *Acanthurus dussumieri* (Cuvier and Valenciennes). *Puálu; Palawi*. (J. & E., p. 390.)

? *Acanthurus argenteus* Quoy and Gaimard, *juv*.

A common species, reaching considerable size. Dusky, with wavy bluish streaks; base of caudal with dark spots.

382. *Acanthurus atramentatus* Jordan and Evermann. *Maikoiko; Maiko*. (J. & E., p. 393.)

¹¹ Following Cantor and Günther others use *Teuthis* in place of *Siganus*. The decisions of the International Commission would favor *Hepatus* as prior to *Acanthurus* or *Teuthis*, though not binomial. Any one of these views may be defended, and, until the matter is definitely settled, we may follow custom.

Common. Distinguished by an ink-like spot at base of last rays of dorsal and anal. Body with narrow broken bluish streaks.

383. *Acanthurus guttatus* Bloch and Schneider. (J. & E., p. 392.)

Rather common. Known by the three white cross-bars and numerous white spots.

384. *Acanthurus sandvicensis* Streets. *Manini*. (J. & E., p. 394.)

Extremely abundant. Pale, with six black cross-bars, four of which cross the entire body. A near ally of *Acanthurus triostegus* (Linnæus) of the South Seas.

ZEBRASOMA Swainson.

§ *Zebrasoma*.

385. *Zebrasoma veliferum* (Bloch). *Kihikihi*. (J. & E., p. 396.)

Acanthurus hypselopterus Bleeker.

Not rare about Honolulu. A fish of striking appearance, remarkable for its banded body and very high fins.

§ *Scopas* Kner.

386. *Zebrasoma flavescens* (Bennett). *Laipala*. (J. & E., p. 397.)

Not common at Honolulu. This fish, entirely bright yellow, seems to differ from *Zebrasoma rhombeum* Kittlitz of the South Seas, only in being all yellow, instead of olive-brown with a few yellow markings. The subgenus *Scopas* differs from *Zebrasoma* in the lower fins with fewer rays.

CTENOCHÆTUS Gill.

(*Ctenodon* Swainson, preoccupied.)

387. *Ctenochætus striatus* (Quoy and Gaimard). *Kale*. (J. & E., p. 398.)

Acanthurus strigosus Bennett.

Rather common. The name *striatus* was given to young examples; that of *strigosus* to the adult.

NASO Lacépède.

Acanthurus Jordan and Evermann, not of Forskål, as restricted.

Monoceros Bloch and Schneider, preoccupied = *Naseus* Cuvier.

388. *Naso incipiens* (Jenkins). (J. & E., p. 400.)

Rare.

389. *Naso brevirostris* (Cuvier and Valenciennes). *Kalalolo*. (J. & E., p. 401.)

South Seas, occasional at Honolulu.

390. *Naso unicornis* (Forskål). *Kala*. (J. & E., p. 402.)

Common at Honolulu. Widely distributed in warm seas. The length of the frontal horn varies much with age, sometimes being in the adult longer than the rest of the head.

CALLICANTHUS Swainson.

391. *Callicanthus lituratus* (Forster). (J. & E., p. 404.)

South Seas; rather common about the Hawaiian Islands.

392. *Callicanthus garretti* (Seale). (J. & E., p. 405.)

Rare. A doubtful species, distinguished from *C. lituratus* by the absence of the blue line along base of dorsal and yellow spots on caudal peduncle separated by a sharply defined black area.

393. *Callicanthus metoposophron* Jenkins. (J. & E., p. 405.)

Not rare at Honolulu.

Order CHROMIDES.

Family XCII. POMACENTRIDÆ (Damsel-fishes).

DASYLLUS Cuvier.

(*Tetradrachmum* Cantor, if *Dascyllus* is to be regarded as preoccupied by *Dascillus*.)

394. *Dascyllus albisella* Gill. (J. & E., p. 266.)

Common about the coral-reefs. The figure copied from Bleeker by Jordan and Evermann (p. 267) represents *D. trimaculatus* of the South Seas.

CHROMIS Cuvier.

(*Heliases* Cuvier and Valenciennes.)

395. *Chromis verater* Jordan and Metz.

Chromis verater Jordan and Metz, Proc. U. S. N. M., XLII, 1911, p. 526.

One example from Honolulu, typical of *Chromis*. D. XIV; caudal short, body very deep.

396. *Chromis elaphrus* Jenkins. (J. & E., p. 268.)

Coral-reefs; typical of the subgenus *Heliases*. D. XII, caudal short, body oblong.

FURCARIA Poey.

(Caudal deeply forked, its lobes sharp; fourteen dorsal spines.)

397. *Furcaria ovalis* (Steindachner). (J. & E., p. 269.)

Coral-reefs; not rare.

398. *Furcaria leucura* (Gilbert). (G., p. 620.)

Rare; in rather deep water.

POMACENTRUS Lacépède.

399. *Pomacentrus jenkinsi* Jordan and Evermann. (J. & E., p. 271.)

Eupomacentrus marginatus Jenkins, the name preoccupied in *Pomacentrus*.

Common. This species belongs to the section or subgenus called *Amblypomacentrus* by Bleeker, having the snout and lower jaw naked. In the American species (*Eupomacentrus* Bleeker) the snout is scaled. In *Pomacentrus* proper there is in each jaw a single series of a few teeth.

ABUDEFDUF Forskål.

(*Glyphisodon* Lacépède.)

400. *Abudefduf sordidus* (Forskål). *Kupipi*. (J. & E., p. 274.)

Very common about rocks. Known by the black blotch behind the dorsal fin on the back of the tail.

401. *Abudefduf abdominalis* (Quoy and Gaimard). *Maomao*. (J. & E., p. 272.)

Common. Known by the four black cross-bands and a large black blotch on dorsal and on anal.

402. *Abudefduf imparipinnis* (Sauvage). (J. & E., p. 274.)

Honolulu. Known only from the original description.

403. *Abudefduf sindonis* Jordan and Evermann. (J. & E., p. 272.)

A rare species, black, with two white cross-bands. Teeth in one series, scarcely compressed, not emarginate; opercle entire; preorbital broad; perhaps to be regarded as the type of a distinct genus, approaching *Chromis*.

Order PHARYNGOGNATHI.

Family XCIII. LABRIDÆ (Wrass-fishes; Rainbow-fishes).

LEPIDAPLOIS Gill.

404. *Lepidaplois albotæniatus* (Cuvier and Valenciennes). *A'awa*. (J. & E., p. 278.)

A large fish, abundant in the markets. Specimens from Hilo, taken about lava-rocks, are very much darker, mostly deep purplish red.

405. *Lepidaplois strophodes* Jordan and Evermann. (J. & E., p. 280.)

Rather rare. All the specimens seen were small in size, but colored differently from the young of *L. albotæniatus*.

406. *Lepidaplois modestus* (Garrett). (J. & E., p. 279.)

Known from Günther's plate, a copy of Garrett's drawing.

VERRICULUS Jordan and Evermann.

407. *Verriculus sanguineus* Jordan and Evermann. (J. & E., p. 281.)

A showy fish. Only the type known; taken with the hook in deep water.

VERREO Jordan and Snyder.

408. *Verreo oxycephalus* (Bleeker). (J. & E., p. 281.)

One specimen known from Kailua. The species belongs to the fauna of Japan. The Australian *V. unimaculatus* is very similar.

HINALEA gen. nov. Jordan and Jordan.

Type: *Julis axillaris* Quoy and Gaimard.

This genus differs from *Stethojulis* Günther in the absence of posterior canines. The scales on the breast are large, the mouth very small, the lateral line complete. *Hinalea* (in Samoan *Sugale* = choice) is the common name of the small labroids at Honolulu.

409. *Hinalea axillaris* (Quoy and Gaimard). *Omaka*. (J. & E., p. 283.)

Common about the reefs.

410. *Hinalea balteata* (Quoy and Gaimard). (J. & E., p. 284.)

Stethojulis albovittatus Jordan and Evermann, "Fishes of the Hawaiian Islands," p. 284, Pl. XXVI; probably not *Labrus albovittatus* Kölreuter, scantily described from an unknown locality. This species is known only from Hawaii, where no collections had been made in Kölreuter's time (1770). It is rather common about the reefs. There seem to be two types of color, the one with a broad stripe of brownish red bordered above and below by a sharply defined line of purplish blue, as in the plate of Jordan and Evermann; the other with the lateral band brown, bordered above and below by a crimson line. We detect no other differences.

PSEUDOJULIS Bleeker.

411. *Pseudojulis cerasina* Snyder. (J. & E., p. 294.)

Known only from the type.

HALICHERES Rüppell.

Parajulis Bleeker; *Chærojulis* Gill, substitute names, if *Halichæres* Rüppell is regarded as preoccupied by *Halichærus* Nilsson, a genus of seals.

412. *Halichæres ornatissimus* (Garrett). *Ohua paawela*. (J. & E., p. 286.)

Halichæres iridescens Jenkins.

Not common.

413. *Halichæres lao* Jenkins. *Lao*. (J. & E., p. 285.)

Rare about Honolulu.

MACROPHARYNGODON Bleeker.

414. *Macropharyngodon geoffroyi* (Quoy and Gaimard). *Hinalea akilolo*. (J. & E., p. 288.)

Macropharyngodon aquilolo Jenkins.

A rare fish about the reefs.

CORIS Lacépède.

(*Hemicoris* Bleeker.)

This genus mainly differs from *Halichæres* in the much smaller scales and in the absence of the posterior canine. This tooth is wanting in the type, *Coris aygula*, as in all the Hawaiian species referred by Jordan and Evermann to *Coris* and *Julis*. In the type of *Julis* (*Labrus julis* Linnæus) this tooth is present. No species of *Julis* is found in Hawaii.

415. *Coris gaimardi* (Quoy and Gaimard). *Lolo*. (J. & E., p. 305.)

Common about the reefs.

416. *Coris pulcherrima* Günther. *Hinalea lolo*; (J. & E., p. 305.)

Very common. Close to the preceding species, but with colors not quite the same.

417. *Coris lepomis* Jenkins. *Hilu lauwiki*; *Uhu*. (J. & E., p. 306.)

A large and handsome fish, often appearing in the markets; easily recognized by the black opercular flap, like that of the genus *Lepomis*, or "Sun-fish," of American streams. The fish recorded by Fowler as *Coris aygula*, Proc. Acad. Nat. Sci. Phila., 1900, p. 510, is no doubt this species.

418. *Coris eydouxi* (Cuvier and Valenciennes). *Hilu*. (J. & E., p. 309.)

A large and beautifully colored species. Common.

419. *Coris flavovittatus* (Bennett). (J. & E., p. 308.)

Very rare. On the plate given by Jordan and Evermann, drawn from a specimen from Laysan, the yellow shades, bright in life, are poorly represented, the colors being very dull.

420. *Coris greenovi* (Bennett). (J. & E., p. 308.)

One of the most beautiful species, blood-red in life, with white spots above, edged with black. Originally described from Hawaii, but not seen there since. Our specimen is from Samoa.

421. *Coris ballieui* Vaillant and Sauvage. (J. & E., p. 310.)
Rather common.
422. *Coris rosea* Vaillant and Sauvage. *Malamalama*. (J. & E., p. 311.)
Coris argenteostriatus Steindachner.
Hemicoris keleipionis Jenkins.
Quite common.
423. *Coris venusta* Vaillant and Sauvage. (J. & E., p. 312.)
Hemicoris remedius Jenkins.
Common.

CHEILIO Lacépède.

424. *Cheilio inermis* Forskål. (J. & E., p. 314.)
This common fish ranges in color through many shades of brown, green, and lemon-yellow, with varied markings.

GOMPHOSUS Lacépède.

425. *Gomphosus varius* Lacépède. *Akilolo*. (J. & E., p. 289.)
Common.
426. *Gomphosus tricolor* Quoy and Gaimard. *Hinalea iivi*. (J. & E., p. 290.)
Very common. The intense blue color does not fade in spirits.
427. *Gomphosus sandwichensis* Günther.
This may be a valid species. We refer to it a cast in the Bishop Museum distinguishable from *Gomphosus tricolor* by a black blotch on the opercle. Color green; snout pinkish red above; a sharp red line behind eye; opercle with a black blotch; base of pectoral yellow; the fin green, blue-black distally; dorsal green, with a narrow sharp red stripe along its middle; caudal green, purple at base.

ANAMPSES Cuvier.

428. *Anampses cuvieri* Quoy and Gaimard. *Opule; Hilu*. (J. & E., p. 291.)
A showy fish, common about the reefs.
429. *Anampses godeffroyi* Günther. (J. & E., pp. 293, 294.)
Anampses evermanni Jenkins.
Not uncommon about the reefs. A large and handsome fish, originally known from a not very accurate painting. (See Jordan and Snyder, Bull. U. S. Fish Comm., XXVI, 1906.)

THALASSOMA Swainson.

(*Julis* Günther, *non* Cuvier, whose tautotype is the Mediterranean species,
Labrus julis Linnæus. *Chlorichthys* Swainson.)

430. *Thalassoma purpureum* Forskål. *Olani*; *Olale*; *Palaea* (very small), *Hou* (large). (J. & E., p. 295.)

A beautiful large fish, rather common at Honolulu. Color mainly blue, with red stripes on the sides.

431. *Thalassoma fuscum* (Lacépède). *Awela*. (J. & E., p. 299.)

A large and handsome fish, which is rather common. Red, with two broken blue-green stripes on side, like rows of Chinese characters, the coloration being much like that of *T. purpureum*, but the shades reversed.

432. *Thalassoma ballieui* (Vaillant and Sauvage). *Hinalea luahine*. (J. & E., p. 297.)

Very abundant.

433. *Thalassoma umbrostigma* (Rüppell). (J. & E., p. 300.)

Quite common. General color green, with broken red stripes on side, and with five dark irregular broken cross-bars.

434. *Thalassoma duperrey* (Quoy and Gaimard). *Hinalea lauwiki*; *A'alaihi*. (J. & E., p. 302.)

Extremely common. A small and rather slender species. Color bluish, darker behind; the front of body behind head with a broad light brown band. A small species.

435. *Thalassoma lutescens* (Solander). (J. & E., p. 303.)

Thalassoma lunare Jordan and Evermann, probably not *Labrus lunaris* Linnæus.

A rare species, near *Thalassoma lunare* of the East Indies. (See Jordan and Snyder, "Notes on Fishes of Hawaii," Bull. U. S. Bur. Fish., XXVI, 1906, p. 214.)

436. *Thalassoma neanis* Jordan and Snyder.

Described in the paper above mentioned, and represented by a colored figure, Plate XII, fig. 2. One specimen from Honolulu. An exquisitely colored little fish, allied to *T. lunare* and *T. lutescens*.

436. *Thalassoma aneitense* (Günther). (J. & E., p. 304.)

An East Indian species, taken twice at Honolulu. It lacks the brilliant blue and red shades of other species.

CHEILINOIDES Bleeker.

This genus is very close to *Cirrhilabrus* Temminck and Schlegel from Japan, differing in the short ventrals, these fins being greatly produced in *Cirrhilabrus*.

438. *Cheilinoides jordani* Snyder. (J. & E., p. 315.)

Only the type known.

PSEUDOCHEILINUS Bleeker.

In this genus the eye is peculiarly modified, the cornea being crossed by a line of partition.

439. *Pseudocheilinus octotænia* Jenkins. *Aleihi lakea*. (J. & E., p. 317.)

Occasional about the reefs.

440. *Pseudocheilinus evanidus* Jordan and Evermann. (J. & E., p. 317.)

Rare, taken but twice.

CHEILINUS Lacépède.

441. *Cheilinus hexagonatus* Günther. *Pooú*. (J. & E., p. 319.)

Cheilinus zonurus Jenkins.

Very common. Originally described from an inaccurate drawing made at Honolulu.

442. *Cheilinus bimaculatus* Cuvier and Valenciennes. (J. & E., p. 320.) (Pl. III, fig. 3; C. M. Catalog of Fishes, No. 3906.)

A small fish, common on the reefs, known by the black spot on the side. The exquisite markings seen in life disappear in spirits.

443. *Cheilinus trilobatus* Lacépède. (J. & E., p. 322.)

Recorded from Honolulu by Quoy and Gaimard as *Cheilinus sinuosus*, which is apparently the female of this common species of the South Seas.

NOVACULICHTHYS Bleeker.

444. *Novaculichthys woodi* Jenkins. (J. & E., p. 323.)

Novaculichthys entargyreus Jenkins.

Novaculichthys tattoo Seale.

Rather common.

445. *Novaculichthys tæniourus* (Lacépède). (J. & E., p. 325.)

Rather common. A showy fish of the reefs. The young, with the first two dorsal rays lengthened, was described from Honolulu by Quoy and Gaimard as *Julis bifer*.

446. *Novaculichthys kallosoma* (Bleeker).

This beautiful little fish, mostly grass-green in color, is widely distributed.

Besides the two originally known from Honolulu we have now a third. The single specimen known from Samoa is figured by Jordan and Evermann.

HEMIPTERONOTUS Lacépède.

447. *Hemipteronotus umbrilatus* Jenkins. (J. & E., p. 333.)
Not common.
448. *Hemipteronotus baldwini* Jordan and Evermann. (J. & E., p. 334.)
Common. Sexes not alike in color, a character rare among labroid fishes.
449. *Hemipteronotus jenkinsi* Snyder. (J. & E., p. 336.)
Only one specimen is known; from Puako Bay, Hawaii.
450. *Hemipteronotus copei* Fowler. (J. & E., p. 332.)
Oahu. Known only from the type. Apparently distinguished by the black spots or blotches and by the presence of bluish streaks on the head.

XYRICHTHYS Cuvier.

451. *Xyrichthys niveilatus* Jordan and Evermann. (J. & E., p. 337.)
Rather common.

INIISTIUS Gill.

452. *Iniistius pavoninus* (Cuvier and Valenciennes). (J. & E., p. 329.)
Iniistius leucozonus Jenkins.
A common food-fish at Honolulu. *Iniistius mundicorpus* Gill from Cape San Lucas seems to be the same.
453. *Iniistius niger* (Steindachner). (J. & E., p. 331.)
Iniistius verater Jenkins.
Rather common. This fish is unique in being almost entirely jet-black.

CYMOLUTES Günther.

454. *Cymolutes leclusei* (Quoy and Gaimard). (J. & E., p. 327.)
A dainty fish, with soft pale colors, rather common about Honolulu.

Family XCIV. SPARISOMATIDÆ.

LEPTOSCARUS Swainson.

(*Callyodon* Cuvier & Valenciennes, not of Gronow and Scopoli.

Calotomus Gilbert.)

455. *Leptoscarus irradians* (Jenkins). (J. & E., p. 339.)
Not common.

456. *Leptoscarus cyclurus* (Jenkins). (J. & E., p. 340.)
One specimen known.
457. *Leptoscarus sandvicensis* (Cuvier and Valenciennes). *Punuhunuhu*. (J. & E., p. 341.)
Very common in the market of Honolulu.
458. *Leptoscarus snyderi* (Jenkins). (J. & E., p. 342.)
From Honolulu; one specimen known.

SCARIDEA Jenkins.

459. *Scaridea zonarcha* Jenkins. (J. & E., p. 343.)
Rare.
460. *Scaridea balia* Jenkins. (J. & E., p. 344.)
One specimen known.
461. *Scaridea aërosa* Jordan and Snyder. (Cf. "Notes on Fishes of Hawaii," Bull. U. S. Bur. Fish., XXVI, 1906, p. 213.)
Two specimens from Honolulu.

Family XCV. SCARIDÆ (Parrot-fishes).

SCARUS Forskål (1775).

(Teeth pale, not blue.)

(Callyodon Gronow (1763) non-binomial; not *Callyodon* Cuvier & Valenciennes.)§ *Callyodon*. (No posterior canines.)

462. *Scarus miniatus* Jenkins. *Uhu*. (J. & E., p. 346.)
An important food-fish, common in the markets, being the favorite species at the native barbecue, or *luau*.
463. *Scarus perspicillatus* Steindachner. *Uhu uli uli*. (J. & E., p. 347.)
A large and handsome fish, valued as food. A colored figure is given by Jordan and Snyder, "Notes on Fishes of Hawaii, etc.," 1907, Pl. XIII.
464. *Scarus borborus* Jordan and Evermann. *Panahu*. (J. & E., p. 349.)
A plain-colored species, rare at Honolulu.
465. *Scarus brunneus* Jenkins. (J. & E., p. 349.)
Rather rare. A dull-colored species, known by the forked caudal.
466. *Scarus dubius* Bennett. (J. & E., p. 350.)
A plainly colored fish, rare at Honolulu, but occurring about Samoa.
467. *Scarus ahula* Jenkins. *Ahu ula*; *Panuhanuhu*. (J. & E., p. 351.)
Rather common. Plain brown.

468. *Scarus bennetti* Cuvier and Valenciennes. (J. & E., p. 352.)

Rare, found also in Samoa.

469. *Scarus paluca* Jenkins. *Palúkalúka*. (J. & E., p. 352.)

Scarce.

§ *Scarus*. (Posterior canines present.)

470. *Scarus jenkinsi* Jordan and Evermann. (J. & E., p. 353.)

But one specimen known.

471. *Scarus gilberti* Jenkins. *Panuhunuhu*. (J. & E., p. 354.)

Very common. Should be compared with *Scarus bataviensis* Bleeker, from Java, for which Steindachner seems to have mistaken it.

472. *Scarus formosus* Cuvier and Valenciennes. *Lauia*. (J. & E., p. 355.)

Scarus lauia Jordan and Evermann.

This species was originally described from Hawaii. The poor description prevents certain recognition, but it is probably identical with *Scarus lauia*, a handsome but rather rare form closely related to *S. gilberti*.

473. *Scarus erythron* Cuvier and Valenciennes. (J. & E., p. 357.)

A common species of the South Seas, recorded as *Pseudoscarus sumbawensis* from Laysan.

PSEUDOSCARUS Bleeker.

(Teeth blue.)

§ *Pseudoscarus*. (Posterior canines present.)

474. *Pseudoscarus jordani* Jenkins. (J. & E., p. 358.)

A large and brilliantly colored fish, thus far only known from two examples, the *type*, taken at Honolulu, and figured by Jordan and Evermann, and another specimen from Samoa.

475. *Pseudoscarus troscheli* (Bleeker). (J. & E., p. 358.)

An East Indian species, recorded by Steindachner from Laysan.

476. *Pseudoscarus heliotropinus* Bryan.

(Bryan, Rept. Bishop Mus., II, 1905 (1906), p. 23, fig. 3.)

Known only from the *type*, which was taken in the market at Honolulu.

Caudal lunate, the angles much produced.

477. *Pseudoscarus vitriolinus* Bryan.

(Bryan, *l.c.*, p. 27, fig. 4.)

A brilliantly colored species. Known only by one example. Caudal rounded.

Order DISCOCEPHALI.

Family XCVI. ECHENEIDÆ (Remoras).

REMORA Gill.

(*Echeneis* Linnæus in part, not as restricted by Gill, 1862.)

478. **Remora remora** (Linnæus). (J. & E., p. 494.)

Not rare. Valued by the Chinese as medicine. Generally common in warm seas.

REMORINA Jordan and Evermann.

479. **Remorina albescens** (Temminck and Schlegel). (J. & E., p. 495.)

Tropical Pacific. Recorded by Fowler from Hawaii.

Order GOBIOIDEI.

Family XCVII. ELEOTRIDÆ (Sleepers).

ELEOTRIS (Gronow) Schneider.

480. **Eleotris sandwicensis** Vaillant and Sauvage. *Oópu*. (J. & E., p. 479.)

Common in shallow water.

ASTERROPTERYX Rüppell.

481. **Asterropteryx semipunctatus** Rüppell. (J. & E., p. 480.)

Common throughout the South Seas. Frequent on the reefs at Honolulu.

•
EVIOTA Jenkins.

482. **Eviota epiphanes** Jenkins. (J. & E., p. 481.)

A minute fish of the reefs, never reaching an inch in length.

GOBIOPTERUS Bleeker.

483. **Gobiopterus farcimen** Jordan and Evermann. (J. & E., p. 482.)

A small rock-fish. One specimen known from Hilo.

Family XCVIII. GOBIIDÆ (Gobies).

QUISQUILIUS Jordan and Evermann.

484. **Quisquilius eugenius** Jordan and Evermann. (J. & E., p. 483.)

A very small fish. Not common. In the type of this species the two ventrals, normally united, had been torn apart, hence the reference in Jordan and Evermann's general report to *Gobiomorphus*. Jaws with small canines.

BATHYGOBIUS Bleeker.

(Mapo Smitt.)

- 485.
- Bathygobius fuscus*
- (Rüppell).
- Oópu.*
- (J. & E., p. 483.)

Gobius albopunctatus Cuvier and Valenciennes.*Gobius sandvicensis* Günther.

Exceedingly common throughout the South Seas in shallow water.

OXYURICHTHYS Bleeker.

- 486.
- Oxyurichthys lonchotus*
- (Jenkins). (J. & E., p. 485.)

Common along the shore. *Oxyurichthys* differs from *Gobiichthys* Klunzinger (*Pselaphias* Jordan and Seale) by the absence of the superorbital cirrus. *Gobionellus* Girard has the tongue notched.

VITRARIA Jordan and Evermann.

- 487.
- Vitraria clarescens*
- Jordan and Evermann. (J. & E., p. 486.)

A minute translucent fish, scarce about the rocks at Hilo.

CHLAMYDES Jenkins.

- 488.
- Chlamydes laticeps*
- Jenkins. (J. & E., p. 486.)

One small specimen from the coral-reefs.

GNATHOLEPIS Bleeker.

(Hazeus Jordan and Snyder.)

- 489.
- Gnatholepis knighti*
- Jordan and Evermann. (J. & E., p. 487.)

A small species, abundant in brackish water about Hilo.

KELLOGGELLA Jordan and Seale.

- 490.
- Kelloggella oligolepis*
- (Jenkins). (J. & E., p. 488.)

A minute fish of the reefs. Not very common. It differs from the type of the genus, *K. cardinalis*, found in Samoa, in having a few scales posteriorly.

CHONOPHORUS Poey.

(Awaous Steindachner.)

The name *Chonophorus*, July, 1860, apparently has priority over *Awaous*, "presented" on July 12 of the same year.

- 491.
- Chonophorus genivittatus*
- (Cuvier and Valenciennes).
- Oópu.*
- (J. & E., p. 492.)

Common in brackish water.

492. **Chonophorus stamineus** (Eydoux and Souleyet). *Oópu*. (J. & E., p. 493.)

The commonest of all the Hawaiian gobies, or *Oópu*, found everywhere in the mouths of streams.

SICYDIUM Cuvier and Valenciennes.

493. **Sicydium stimpsoni** Gill. (J. & E., p. 489.)

A river-fish, locally abundant at Hilo.

494. **Sicydium albotæniatum** Günther. (J. & E., p. 490.)

A fish of the rivers, known only from a drawing by Garrett.

LENTIPES Günther.

(*Sicyogaster* Gill; preoccupied.)

495. **Lentipes concolor** (Gill). (J. & E., p. 491.)

Scarce in the rivers about Hilo. Body said to be wholly naked.

496. **Lentipes seminudus** Günther. (J. & E., p. 491.)

One specimen recorded from a stream near Honolulu. Posterior half of body with small scales, the anterior region naked.

Order JUGULARES.

Family XCIX. PARAPERCIDÆ.

OSURUS Jordan and Evermann.

497. **Osurus schauinslandi** (Steindachner). (J. & E., p. 475; G., p. 642.)

Parapercis pterostigma Jenkins.

Not rare at moderate depths.

NEOPERCIS Steindachner.

498. **Neopercis roseoviridis** Gilbert. (G., p. 643.)

Two specimens, taken off Maui.

BEMBROPS Steindachner.

499. **Bembrops filifera** Gilbert. (G., p. 643.)

Deep water off Maui.

CHRIONEMA Gilbert.

500. **Chrionema chryseres** Gilbert. (G., p. 645.)

Deep sea off Oahu.

501. **Chrionema squamiceps** Gilbert. (G., p. 646.)

Deep sea off Maui.

PTEROPSARON Jordan and Snyder.

- 502.
- Pteropsaron incisum*
- Gilbert. (G., p. 647.)

Deep sea off Laysan.

Family C. CHAMPSODONTIDÆ.

A singular family of uncertain relationships. The ventrals, although inserted well forward, are said to be attached to the shoulder-girdle. This with other features suggests affinities with the *Parapercidæ* and other Trachinoid Jugulares.

CHAMPSODON Günther.

- 503.
- Champsodon fimbriatus*
- Gilbert. (G., p. 648.)

Deep sea, Pailolo Channel.

Family CI. DRACONETTIDÆ.

DRACONETTA Jordan and Fowler.

- 504.
- Draconetta hawaiiensis*
- Gilbert. (G., p. 652.)

One specimen from the Pailolo Channel.

Family CII. CALLIONYMIDÆ (Dragonets).

CALLIONYMUS Linnæus.

- 505.
- Callionymus cæruleonotatus*
- Gilbert. (G., p. 648.)

Pailolo Channel between Maui and Molokai.

- 506.
- Callionymus corallinus*
- Gilbert. (G., p. 649.)

One specimen; Avan Channel between Maui and Lanai.

- 507.
- Callionymus rubrovinctus*
- Gilbert. (G., p. 650.)

Off Molokai and Maui at moderate depths.

CALLIURICHTHYS Jordan and Fowler.

- 508.
- Calliurichthys decoratus*
- Gilbert. (G., p. 651.)

About Oahu, Molokai, and Maui at moderate depths.

- 509.
- Calliurichthys astrinius*
- ¹²
- sp. nov. Jordan and Jordan. (Pl. IV, fig. 1.)

Type: No. 3903 Carnegie Museum. Honolulu Market. D. S. Jordan coll.

Head 3.8 to tip of preopercular spine in length to base of caudal; depth 7; dorsal rays IV, 9; anal rays 8; pectoral 17; eye 3.4 in head as above; maxillary 3.4; snout 3.2 to tip of preopercular spine.

Body slender, though stouter than in *C. decoratus*; snout rather long and low;

¹² *astrinius* from ἀστὴρ = star; νύχιον = the nape.

mouth small; the maxillary not reaching front of orbit; eyes large, the bony interorbital space not grooved; occipital region with two clusters of low bony radiating ridges; preopercular spine long, straight, reaching past axil of anal and to below second dorsal spine, its upper edge with about seven small serræ, a strong spine directed forward at its base, lower edge of spine smooth; no other spine on head.

First ray of dorsal filamentous, reaching fifth soft ray, the others progressively shorter; tip of last soft ray reaching just past base of caudal, the height of the soft rays nearly twice that of the body below them; the rays subequal in height, higher than all the dorsal spines, except the first; anal beginning and ending slightly behind soft dorsal. Lateral line evident, forking on head and on base of tail, extending on fourth caudal ray for a very short distance. Pectoral fin broad, not symmetrical, 1.25 in head; ventrals longer, 1.1; caudal fin excessively long, as usual in the males of this genus, half longer than head.

Color olivaceous brown above, white below, cheeks dusky; sides with quadrate light gray spots, deeper than long and arranged in irregular quincunx, with roundish dark spots and gray spots interspersed, those on back smaller, the pattern indescribable, but well shown in the figure; head with round black spots and larger gray ones; first dorsal with four or five dark cross-shades; the tips of the posterior three spines darker, first or long spine with dark cross-bars. Soft dorsal with six or seven rows of small dark spots intermingled with much smaller ones; caudal with twelve cross series of small black spots; lower two-thirds of anal nearly white; distal part black with small white spots; ventrals with three or four rows of round black spots; breast and opercles with fainter spots, similar in fashion; pectorals colorless.

This species is allied to *Calliurichthys decoratus*, differing in the less elongate body and the coloration. The type is unique, presumably a male, judging from the filamentous dorsal. It is nearly six inches long, including caudal.

510. *Calliurichthys zanectes*¹³ sp. nov. Jordan and Jordan. (Pl. IV, fig. 2.)

Type No. 3904 Carnegie Museum, Honolulu Market. D. Starr Jordan coll.

Head 3.33 in length to base of caudal; depth 8.5; dorsal rays 9; anal rays 8; pectoral rays 15; eye 4.5 in head; snout 2.66 to end of preopercular spine; maxillary 4.

Body very slender; head low; the snout rather long and depressed; the maxillary not nearly reaching the front of eye; preopercular spine straight, rather short, not reaching base of second dorsal spine, upper edge of the spine with a

¹³ *zanectes*, derived from ζᾶ an intensive particle, and νήκτης = swimmer.

series of eight or nine saw-teeth; a strong spine directed backward at base; back of head with two groups of radiating bony ridges, a little plainer than in the preceding species; first dorsal spine not produced, barely longer than the second, all of them lower than the soft rays. Caudal fin excessively long, a little longer than the rest of the body; first dorsal spine 1.75 in head; pectoral 1.166; ventral a little longer than head; tips of dorsal and anal extending a little beyond base of caudal. Lateral line well developed, with some branches on head.

Color dark olive above, pale below; sides with several vague dark cross-shades; sides of back with irregular white spots, some of them quadrate and rather large, others round and small, the lower series comma-shaped, the point turned downward and backward; a larger round dark spot just below middle line at base of caudal; head with small dark spots; first dorsal jet-black at tip; a white crescent setting off the black margin, rest of fin white with small black spots and dark cross-shades. Soft dorsal profusely covered with round black spots, arranged in sinuous rows, among which are dark streaks. Caudal with black spots of various sizes, those at its base smaller, the whole arranged in about ten irregular cross-bands. Distal half of anal jet-black, basal part white. Ventrals and breast partly white, with some rather large irregular black spots. Pectorals with much smaller spots, growing fainter below.

This interesting species is known from the type, which is ten and one half inches long, including the caudal fin. It was found in the market at Honolulu. It is nearest *Calliurichthys astrinius* from the same locality, but has a slenderer body, the first dorsal spine lower, and the caudal longer. The short dorsal spine is often characteristic of the female in this family, but the longer caudal indicates the male. It is barely possible that this may prove to be the female of *C. astrinius*.

Family CIII. CLINIDÆ.

ENNEAPTERYGIUS Rüppell.

(*Enneanectes* Jordan and Evermann.)

511. *Enneapterygius atripes* (Jenkins). (J. & E., p. 496.)

Common in holes in the coral-reefs. A dainty little fish, rarely two inches long, found in Hawaii, as in Samoa, in company with species of *Eviota*.

Family CIV. BLENNIDÆ (Blennies).

BLENNIUS Linnæus.

512. *Blennius sordidus* Bennett. (J. & E., p. 497.)

Recorded by Bennett from Hawaii.

RUPISCARTES Swainson.

(Alticus (Commerson) Bleeker.)

Canines present; dorsal fin divided. The question of the pertinence of the name *Rupiscartes* is not yet settled, and perhaps the older name *Alticus* should be used, although non-binomial.

513. *Rupiscartes variolosus* (Cuvier and Valenciennes). (J. & E., p. 497.)

South Seas. Rather rare about Hawaii.

514. *Rupiscartes marmoratus* (Bennett). (J. & E., p. 498.)

Hawaii. Quite common about the reefs.

515. *Rupiscartes gibbifrons* (Quoy and Gaimard). (J. & E., p. 498.)

Salarias rutilus Jenkins.

Rather rare. A fish of the reefs.

SALARIAS Cuvier.

516. *Salarias zebra* Vaillant and Sauvage. (J. & E., p. 501.)

Salarias cypho Jenkins.

Very abundant along the reefs.

517. *Salarias edentulus* (Bloch and Schneider).

Reported from Laysan and Honolulu, but not seen by us.

EXALLIAS Jordan and Evermann.

518. *Exallias brevis* (Kner). *Pao'okawila*. (J. & E., p. 503.)

Rather rare.

ENCHELYURUS Peters.

519. *Enchelyurus ater* (Günther). (J. & E., p. 500.)

A very small fish, not rare on the reefs.

Family CV. CONGROGADIDÆ.

CONGROGADUS Günther.

520. *Congrogadus marginatus* Vaillant and Sauvage. (J. & E., p. 504.)

Known only from the type, said to be from Hawaii.

Family CVI. BROTULIDÆ.

BROTULA Cuvier.

521. *Brotula marginalis* Jenkins. (J. & E., p. 507.)

Scarce.

522. *Brotula multicirrata* Vaillant and Sauvage. (J. & E., p. 508.)

Rare.

Family CVII. LYCODAPODIDÆ

SNYDERIDIA Gilbert.

- 523.
- Snyderidia canina*
- Gilbert. (G., p. 655.)

Deep sea, off Kauai.

Family CVIII. FIERASFERIDÆ (Pearl-fishes).

(Carapidæ.)

FIERASFER Cuvier.

(Carapus Rafinesque, in part.)

- 524.
- Fierasfer microdon*
- Gilbert. (G., p. 655.)

Avan Channel. One specimen known.

- 525.
- Fierasfer homei*
- (Richardson). (J. & E., p. 535.)

One specimen from the interior of a Holothurian (*Stichopus*).

JORDANICUS Gilbert.

- 526.
- Jordanicus umbratilis*
- (Jordan and Evermann). (J. & E., p. 505; G., p. 656.)

Puako Bay. One specimen known. Being entirely black in color, it probably inhabits lava-rocks, rather than the interior of Holothurians or large lamellibranchs.

Order PLECTOGNATHI.

Suborder SCLERODERMI.

(This group is clearly connected with the *Squamipennes*.)

Family CIX. BALISTIDÆ (Trigger-fishes).

SUFFLAMEN Jordan.

(*Pachynathus* Swainson. Name preoccupied as *Pachygnathus*, of which the International Commission of Nomenclature regards it as a misprint. Cf. Jordan, Copeia, 1916, p. 27. Archetype *Balistes capistratus* Shaw.)

This genus is near *Balistes*, differing in the convex caudal, the low, more or less rounded dorsal and anal, and in the presence of spines or tubercles on the caudal peduncle. Ventral flap with small thick spines. Lateral line incomplete. A groove before the eye as in *Balistes*.

- 527.
- Sufflamen vidua*
- (Solander).
- Humuhumu hiukole*
- ;
- Humuhumu uli*
- . (J. & E., p. 409.)

South Seas. Not common at Honolulu.

528. *Sufflamen bursa* (Lacépède). *Humuhumu lei*. (J. & E., p. 410.)
South Seas. Rather common at Honolulu.
529. *Sufflamen capistratus* (Shaw). *Humuhumu numi*; *Mimi*. (J. & E., p. 411.)
Common. Known by the golden ring around the mouth, with a pale streak behind it, this often wanting.
530. *Sufflamen fuscolineatus* (Seale). (J. & E., p. 409.)
Rare. Known only from the types.
531. *Sufflamen nycteris* (Jordan and Evermann). (J. & E., p. 408.)
Known only from the type. Scales very small; color black.

BALISTAPUS Tilesius.

532. *Balistapus rectangulus* (Bloch and Schneider). *Humuhumu nukunuku apua'a*. (J. & E., p. 413.)
Rather common.
533. *Balistapus aculeatus* (Linnæus). (J. & E., p. 414.)
South Seas. Not rare in Hawaii.

CANTHIDERMIS Swainson.

534. *Canthidermis angulosus* (Quoy and Gaimard). (J. & E., p. 415.) (Pl. IV, fig. 3; C. M. No. 3905).

This species, the type of the genus *Canthidermis*, has not been seen since it was first described by Quoy and Gaimard from Hawaii in 1824. We present a figure of a fine example found in the Honolulu market by Mr. Grinnell in August, 1921.

535. *Canthidermis aureolus* (Richardson). (J. & E., p. 415.)
Recorded from Laysan by Steindachner.

XANTHICHTHYS Kaup.

536. *Xanthichthys lineopunctatus* (Hollard). (J. & E., p. 416.)
Xanthichthys mento Jordan and Gilbert.
Rare. Lately taken off San Diego, as well as at Clarion Island.

MELICHTHYS Swainson.

537. *Melichthys radula* (Solander). *Humuhumu eleele*. (J. & E., p. 417.)
Not common.

Family CX. MONACANTHIDÆ (Leather-jackets).

CANTHERINES Swainson.

538. *Catherines sandwichiensis* (Quoy and Gaimard). *O'ililepa; Ohua.* (J. & E., p. 418.)

Catherines carolæ Jordan and McGregor.

Not rare.

539. *Cantherines albopunctatus* (Seale). (J. & E., p. 420.)

Rare. Also recorded from Tahiti by Regan as *Pseudomonacanthus multimaculatus*.

STEPHANOLEPIS Gill.

540. *Stephanolepis spilosomus* (Lay and Bennett). *Oili uwiwi.* (J. & E., p. 420.)

Common at intervals. Its appearance is said to precede the death of some great personage.

541. *Stephanolepis pricei* Snyder. (J. & E., p. 421.)

Deep water off Kauai. Only one specimen known.

ALUTERA Cuvier.

§ *Osbeckia* Jordan and Evermann.

542. *Alutera liturosa* Shaw. *O'ililepa; Ohua.* (J. & E., p. 422.)

Osbeckia scripta Jordan and Evermann. Perhaps the same as *Alutera scripta* (Osbeck) the type of which from the Canaries represents the Atlantic form.

Not common. The young show little trace of the characteristic markings.

§ *Alutera* Cuvier.

543. *Alutera monoceros* (Osbeck). *Loulu.* (J. & E., p. 423.)

Common in the South Seas. Known from Honolulu only from a painting by Mrs. Dillingham.

Suborder GYMNOTONTES.

Family CXI. TETRAODONTIDÆ (Puffers).

LAGOCEPHALUS Swainson.

544. *Lagocephalus oceanicus* Jordan and Evermann. (J. & E., p. 425.)

Known by two examples from the Honolulu market.

SPHEROIDES Lacépède.

545. *Spheroides florealis* (Cope). (J. & E., p. 426.)

Rare about Hawaii.

TETRAODON Linnæus.

(Arothron Müller and Henle.)

The relations of the Pacific species, representing the section called *Ovoides*, to the original *Tetraodon lineatus* of Egypt have not been determined. According to Gill the skull differs materially in the two groups.

§ *Ovoides* Cuvier.

546. *Tetraodon hispidus* Linnæus. *Maki-maki*; *Oópuháie*; *Keke*. (J. & E., p. 427.)

Very abundant and widely distributed. The flesh is reported to be extremely poisonous, as the name *Maki* (= death) indicates.

547. *Tetraodon lacrymatus* (Cuvier). (J. & E., p. 429.)

Arothron ophryas Cope.

Ovoides latifrons Jenkins.

Rare. Originally described from Hawaii, but not taken by us.

Family CXII. CANTHIGASTERIDÆ.

CANTHIGASTER Swainson.

(Tropidichthys Bleeker; *Eumycterias* Jenkins.)

548. *Canthigaster jactator* (Jenkins). (J. & E., p. 430.)

Rare.

549. *Canthigaster oahuensis* (Jenkins). (J. & E., p. 432.)

Rare.

550. *Canthigaster cinctus* (Solander). (J. & E., p. 433.)

South Seas. Rare at Honolulu.

551. *Canthigaster psegma* Jordan and Evermann. (J. & E., p. 433.)

Two specimens known; commoner in Samoa.

552. *Canthigaster janthinus* (Vaillant and Sauvage). (J. & E., p. 434.)

Known only from the original type.

553. *Canthigaster epilamprus* (Jenkins). *Puu olai*. (J. & E., p. 434.)

Known only from the type.

554. *Canthigaster bitæniatus* Jenkins. (J. & E., p. 435.)

Known only from the type. Perhaps the same as the Japanese *Canthigaster rivulatus*.

Family CXIII. DIODONTIDÆ (Porcupine-fishes).

CHILOMYCTERUS Bibron.

- 555.
- Chilomycterus affinis*
- Günther. (J. & E., p. 438.)

Chilomycterus californiensis Eigenmann.

Not rare about Honolulu, where we have lately taken a large example.

DIODON Linnæus.

- 556.
- Diodon hystrix*
- Linnæus. (J. & E., p. 437.)

Scarce.

- 557.
- Diodon holacanthus*
- Linnæus. (J. & E., p. 436.)

Laysan.

- 558.
- Diodon nudifrons*
- Jenkins. (J. & E., p. 438.)

Rare.

Family CXIV. MOLIDÆ (Head-fishes).

MOLA Kölreuter.

(Mola Cuvier; *Orthagoriscus* Bloch.)

- 559.
- Mola mola*
- (Linnæus).

One example has been recorded in the local press as having been taken at Honolulu.

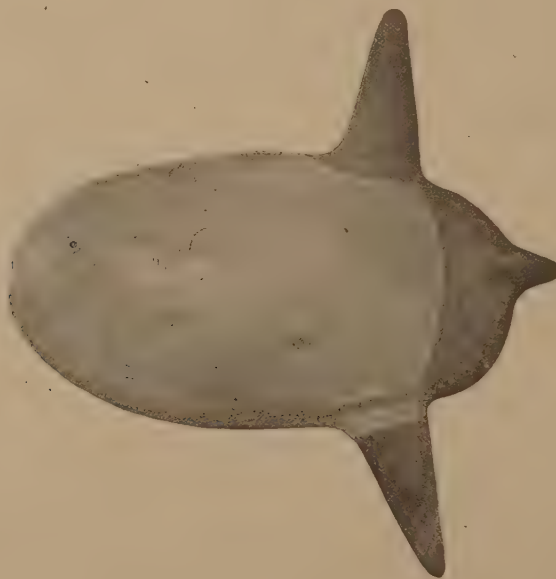


FIG. 7. *Masturus lanceolatus* (Liénard). From a cast four feet long in the Bernice Pauahi Bishop Museum, Honolulu.

MASTURUS Gill.

(Cf. Gill, Proc. U. S. N. M., VII, 1884, p. 425.)

Caudal fin pointed; otherwise much as in *Mola*.

560. *Masturus lanceolatus* (Liénard).

Orthogoriscus oxyropterus Bleeker.

The Bishop Museum contains a cast four feet long of this very rare species. Of this cast we present a photograph. The posterior parts are marked with many small white spots. This is the third specimen of a *Masturus* on record.

RANZANIA Nardo.

561. *Ranzania makua* Jenkins. *Makua*; *Apahu*. (J. & E., p. 440.)

Four examples are now known from Honolulu and one from Japan. A fine cast of a large example is in the Bishop Museum. It is very doubtful whether the species is distinct from *Ranzania truncata* Nardo, of the Atlantic.

This strange fish is very handsomely colored in life, as Dr. Jenkins' excellent plate shows.

Suborder OSTRACODERMI.

Family CXV. OSTRACIIDÆ (Trunk-fishes).

OSTRACION Linnæus.

562. *Ostracion sebæ* Bleeker. *Môa*. (J. & E., p. 442.)

Ostracion camurum Jenkins.

Abundant about Honolulu.

563. *Ostracion oahuense* Jordan and Evermann. (J. & E., p. 443.)

Rather scarce.

564. *Ostracion lentiginosum* Bloch and Schneider. *Oopakaku*. (J. & E., p. 443.)

South Seas. Rare at Honolulu.

LACTORIA Jordan and Fowler.

565. *Lactoria schlemmeri* Jordan and Snyder. (J. & E., p. 444.)

Laysan.

566. *Lactoria galeodon* Jenkins. (J. & E., p. 445.)

Rare about Honolulu.

CAPROPYGIA Gray.

(*Kentrocapros* Kaup.)

This genus differs from *Aracana* in having the carapace six-ridged.

567. *Capropygia spilonota* (Gilbert). (G., p. 627.)

Laysan, rare.

Order **PEDICULATI.**Family CXVI. **LOPHIIDÆ** (Fishing-frogs).**LOPHIOMUS** Gill.

568. *Lophiomus miacanthus* Gilbert. (G., p. 691.)

Deep seas off Hawaii.

Family CXVII. **ANTENNARIIDÆ** (Sea-toads).**ANTENNARIUS** (Commerson) Lacépède.

569. *Antennarius sandvicensis* (Bennett). (J. & E., p. 518.)

Rare.

570. *Antennarius commersoni* Lacépède. (J. & E., p. 518.)

South Seas. Found at Honolulu by Jenkins.

571. *Antennarius leprosus* Eydoux and Souleyet. (J. & E., p. 519.)

Rare. Known only from Honolulu.

572. *Antennarius laysaninus* Jordan and Snyder. (J. & E., p. 520.)

Laysan. Only one specimen is known.

573. *Antennarius bigibbus* Lacépède. (J. & E., p. 520.)

South Seas. Rare about Hawaii.

574. *Antennarius drombus* Jordan and Evermann. (J. & E., p. 521.)

South Seas. Rare.

575. *Antennarius duescus* Snyder. (J. & E., p. 522.)

Occasional at moderate depths.

576. *Antennarius nexilis* Snyder. (J. & E., p. 523.)

Honolulu. Only one specimen known.

Family CXVIII. **CHAUNACIDÆ.****CHAUNAX** Lowe.

577. *Chaunax umbrinus* Gilbert. (G., p. 693.)

Deep sea. Pailolo Channel. Only one specimen known.

Family CXIX. **CERATIIDÆ** (Sea-devils).**MIOPSARAS** Gilbert.

578. *Miopsaras myops* Gilbert. (G., p. 694.)

Deep sea off Kauai. Only one specimen known.

Family CXX. OGCOCEPHALIDÆ (Sea-bats).

MALTHOPSIS Alcock.

579. *Malthopsis mitrigera* Gilbert and Cramer. (G., p. 695.)

Deep sea, abundant.

580. *Malthopsis jordani* Gilbert. (G., p. 695.)

Deep sea, not rare.

HALIEUTÆA Cuvier and Valenciennes.

581. *Halieutæa retifera* Gilbert. (G., p. 696.)

Deep sea, not rare.

DIBRANCHUS Peters.

582. *Dibranchus erythrinus* Gilbert. (G., p. 697.)

Deep sea off Kauai. One specimen known.

583. *Dibranchus stellulatus* Gilbert. (G., p. 698.)

Deep sea off Maui. One specimen known.

INTRODUCED SPECIES.

Order EVENTOGNATHI.

Family CYPRINIDÆ.

CYPRINUS Linnæus.

- Cyprinus carpio* Linnæus. (Carp.) (J. & E., p. 527.)

Carp have been (unfortunately) introduced into ponds on Maui and Kauai.

CARASSIUS Nilsson.

- Carassius auratus* (Linnæus). Gold-fish. (J. & E., pp. 527, 532.)

The common gold-fish from Japan has escaped into streams.

Order NEMATOGNATHI.

Family AMEIURIDÆ.

AMEIURUS Rafinesque (Catfish).

- Ameiurus nebulosus* (Le Sueur). (J. & E., p. 530.)

The common catfish of the Potomac has been taken from California to Hilo. Its fate is unknown.

Family CLARIIDÆ.

CLARIAS (Gronow) Scopoli.

Clarias fuscus (Lacépède). (J. & E., p. 530.)

Introduced from China; said to be occasionally taken about Honolulu.

Order HAPLOMI.

Family CYPRINODONTIDÆ.

GAMBUSIA Poey (Top-minnows).

Gambusia affinis Baird and Girard.

Introduced from Galveston, Texas, by Mr. Alvin Seale to kill mosquitoes. Now abundant in fresh-water pools.

Order LABYRINTHICI.

Family OPHICEPHALIDÆ.

OPHICEPHALUS Bloch.

Ophicephalus striatus Bloch. (J. & E., p. 533.)

Introduced by the Chinese into ponds about Honolulu; and now said to be common.

Family CENTRARCHIDÆ.

(Micropteridæ.)

MICROPTERUS Lacépède.

Micropterus salmoides (Lacépède.)

A species of Black Bass was brought to Hilo in 1897 and placed in the Wailuke River. It is supposed that all were swept away by a freshet soon after they were planted.

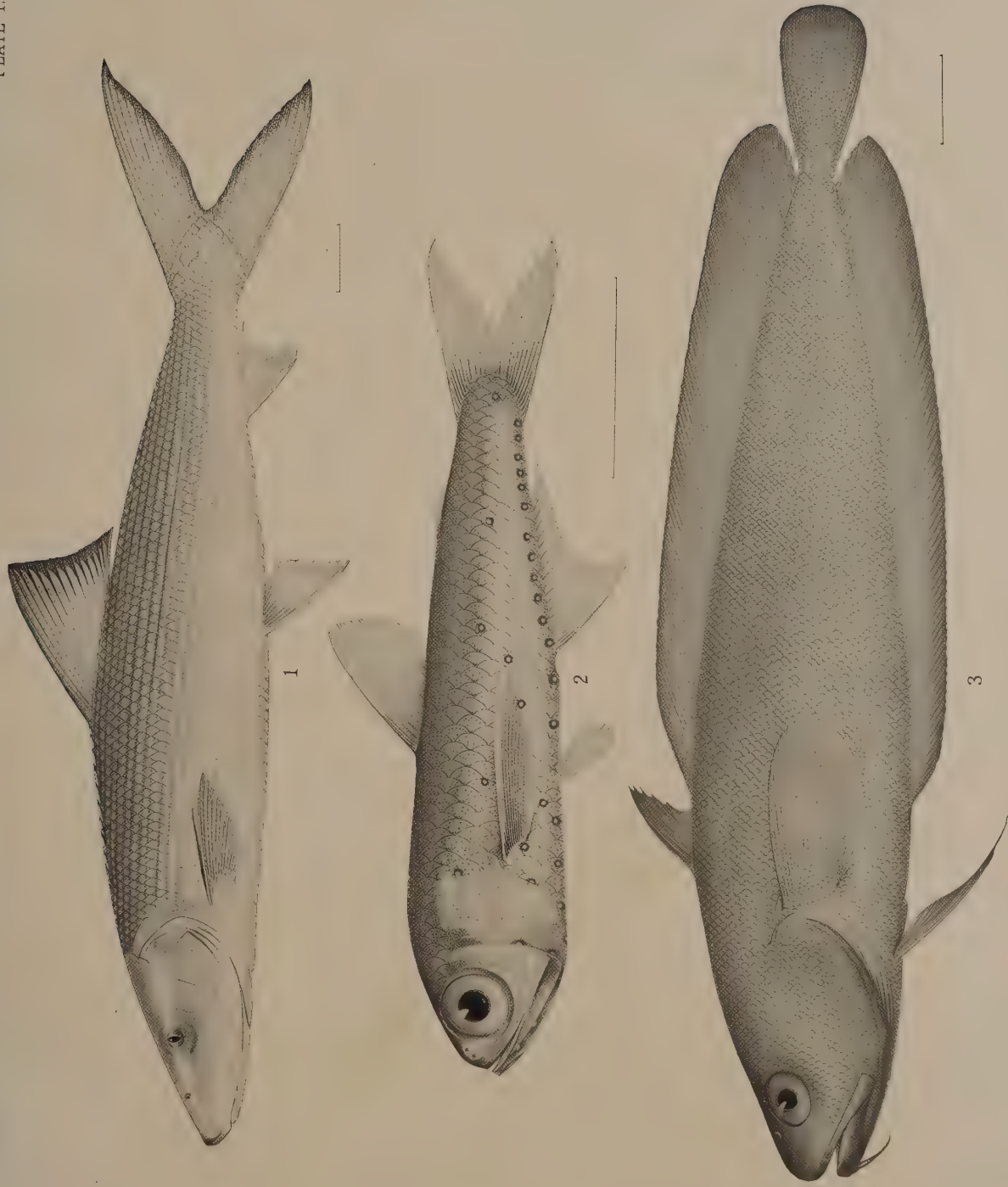
ADDENDA.

No. 133a. *Hymenocephalus tenuis* Gilbert and Hubbs, Proc. U. S. Nat. Mus., Vol. LIV, 1919, p. 173.

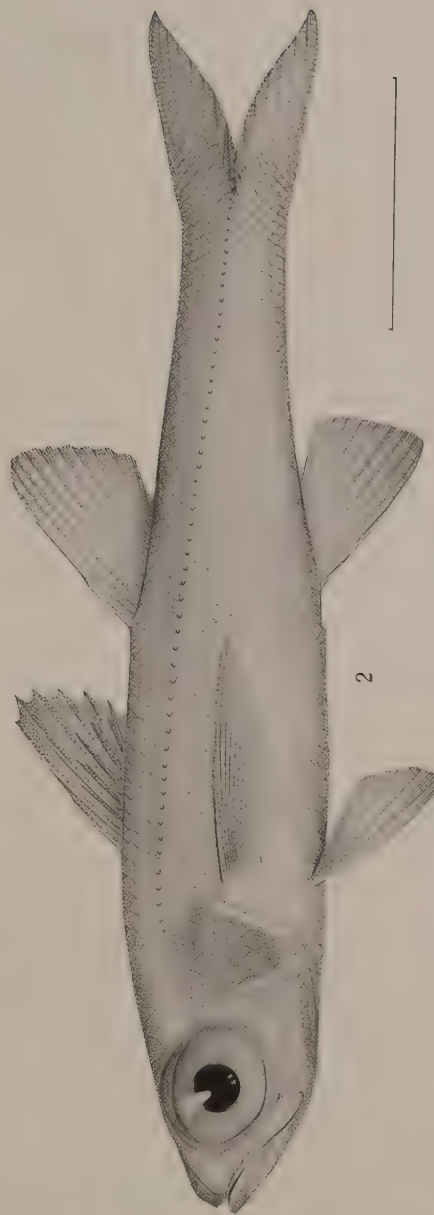
Deep seas. Off Oahu, dredged by "Albatross."

This species was unfortunately overlooked during the preparation of the manuscript.

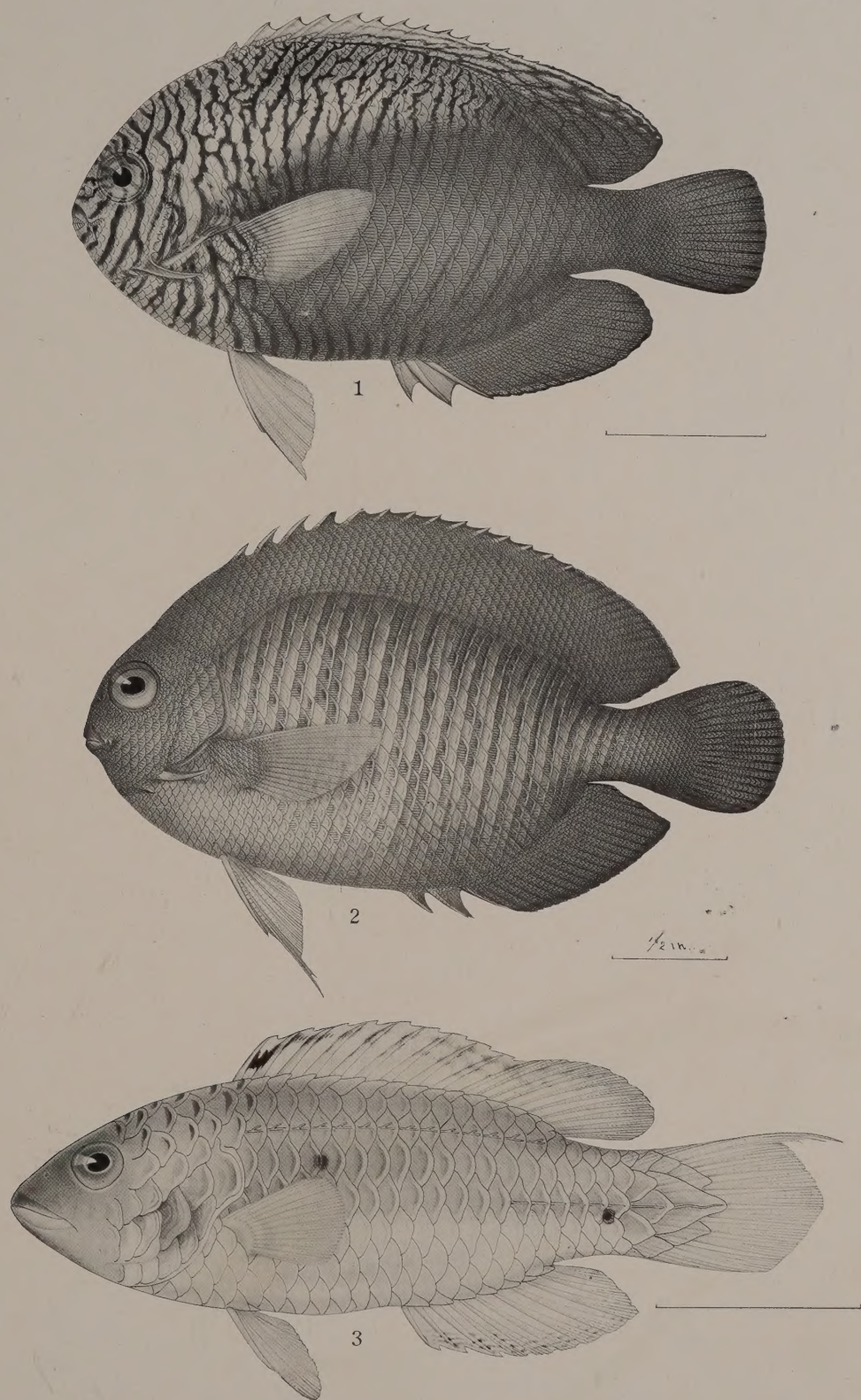
No. 254. Since the paged proof of this article went to press Mr. John T. Nichols has published this species in the "American Museum Novitates," No. 50, p. 2.



1. *Albula virgata* Jordan & Jordan. Type. No. 3896, C. M. 2. *Myctophum hollandi* Jordan & Jordan. Type. No. 3897, C. M.
3. *Physiculus grinnelli* Jordan & Jordan. Type. No. 3898, C. M.



1. *Eumegistius illustris* Jordan & Jordan. Type. No. 3899, C. M.
2. *Scepterias fragilis* Jordan & Jordan. Type. No. 3900, C. M.



1. *Centropyge potteri* (Jordan & Metz.) Adult male. No. 3901, C. M. Honolulu.
2. *Centropyge tutuila* Jordan & Jordan. Type. No. 3902, C. M. Samoa.
3. *Cheilinus bimaculatus* Cuv. & Val. No. 3906, C. M. Honolulu.

60. Gasteropoda of the Chazy. RAYMOND	1.35	99. Ichthyological Survey About the San Juan Islands, Washington. STARKS	.75
61. Occurrence of Wynnea Americana in Pa. JEN- NINGS	.05	100. New Species of Pygidium. EIGENMANN	.10
62. Account of Pleistocene Fauna Discovered at Frankstown, Pa. HOLLAND	.10	101. The Brachiopoda and Ostracoda of the Chazy. RAYMOND	.50
63. Vertebrate Fossils from the Vicinity of Pitts- burgh, Pa. CASE	.15	102. A New Camel from the Miocene of Western Nebraska. PETERSON	.15
64. Illanidae from the Black River Limestone near Ottawa, Canada. RAYMOND and NARRAWAY	.20	103. Skeleton of Stenomylus hitchcocki, etc. PETER- SON	.15
65. Rhinoceroses from the Oligocene and Miocene of North Dakota and Montana. DOUGLASS	.25	104. Skeleton of Diceratherium cooki. PETERSON	.15
66. Fossil Horses from North Dakota. DOUGLASS	.30	105. Carnegie Museum Expedition to Central South America, 1907-1910. HOLLAND	.15
67. Oligocene Lizards. DOUGLASS	.20	106. Report Upon the Expedition of the Carnegie Museum to Central South America, HASE- MAN & EIGENMANN	.25
68. The Type of Stenomylus gracilis. PETERSON	.25	107. New Species of Fishes, etc., from Central South America. HASEMAN	.50
69. New Species of Birds from Costa Rica, etc. CARRIKER	.10	108. Annotated Catalog of Cichlid Fishes from Cen- tral South America. HASEMAN	1.25
70. Costa Rican Formicariidae. CARRIKER	.05	109. New Species of Fishes from the Rio Ignassu. HASEMAN	.65
71. Vertebrate Fossils from the Fort Union Beds. DOUGLASS	.45	110. Ornithology of the Bahama Islands. TODD & WORTHINGTON	.75
72. List of the Lepidoptera of Western Pa., etc. ENGEL	1.25	112. South American Acridoidea. I. BRUNER	1.00
73. Fauna of Upper Devonian in Montana. Fossils of Red Shales. RAYMOND	.60	113. Species of Hasemania, Hyphessobrycon, and Hemigrammus. ELLIS	.25
74. New Species of Procamelus from Upper Mio- cene of Montana. DOUGLASS	.30	114. New Characins in the Carnegie Museum. EIGEN- MANN	.30
75. Sections of the Conemaugh Series between Pittsburgh and Latrobe, Pa. RAYMOND	.35	115. Jurassic Saurian Remains Ingested within Fish. EASTMAN	.20
76. List of the Unionidae of Western Pa. ORTMANN	.50	116. Autograph Letter of U. S. Grant to Edwin M. Stanton. HOLLAND	.15
77. Geological Reconnaissance in North Dakota, Montana, and Idaho. DOUGLASS	1.00	117. Albert J. Barr. By W. J. HOLLAND	.10
78. Botanical Survey of Presque Isle. JENNINGS	2.75	118. Seventeen New Neotropical Birds. TODD	.25
79. Sesqui-Centennial (Pittsburgh) Relics. STEWART	.45	119. Dr. David Alter, the First Discoverer of Spec- trum Analysis. HOLLAND	.10
80. Dromomeryx, New Genus of American Rumi- nants. DOUGLASS	.30	120. Two Mummy Labels. ALLEN	.10
81. Fossils from Glacial Drift and Devonian and Mississippian near Meadville, Pa. MILLARD	.10	121. The Families and Genera of Najades. ORT- MANN	1.00
82. New Species of Helodus. EASTMAN	.05	122. Group of Stenomylini in the Carnegie Museum. PETERSON	.25
83. Charles Chauncey Mellor. HOLLAND	.15	123. Tertiary Fish-remains from Spanish Guinea. EASTMAN	.25
84. Reports of Expedition to British Guiana, etc. EIGENMANN	.50	124. Plated Nematognaths. ELLIS	.65
85. Reports of Expedition to British Guiana, etc. DURBIN	.25	125. New Species of Cambarus from the Isle of Pines. ORTMANN	.15
86. Odonata of the Neotropical Region, Exclusive of Mexico and Central America. CALVERT	2.25	126. Sedum Carnegiei, a New Species of the Family Crassulaceae, etc. HAMET	.10
87. Deinonychus hatcheri, a New Genus and Species of Crocodile. HOLLAND	.20	127. Two New Species of Fishes from Peru. EIGEN- MANN	.15
88. Reports on Expedition to British Guiana, etc. BLOSSER	.15	128. South American Locusts (Acridoidea). II. BRUNER	.75
89. Description of Some New Titanotheres from the Uinta. DOUGLASS	.25	129. Revision of the Genus Chamaepelia. TODD	.85
90. Annotated List of the Birds of Costa Rica In- cluding Cocos Island. CARRIKER	3.00	130. New Genus and Species of Abyssinian Rodents. CHILDS FRICK	.20
91. Geology of the Coast of the State of Alagoas, Brazil. BRANNER	.40	131. New Titanotheres from the Uinta. PETERSON	.20
92. Fossil Fishes from the Bituminous Shales at Ri- acho Doce, Alagoas, Brazil. JORDAN	.55	132. Small Titanotheres from the Lower Uinta. PETER- SON	.10
93. Ordovician Trilobites, No. II. Asaphidae from the Beekmantown. RAYMOND	.35	133. Osteology of Lasiopyga and Callithrix, etc. SHUFFELDT	.25
94. Ordovician Trilobites, No. III. RAYMOND & NARRAWAY	.35	134. New Rhynchocephalian from Solenhofen. GRIEß COCKERELL	.15
95. Ordovician Trilobites, No. IV. RAYMOND	.40	135. Scales of South American Characinid Fishes. COCKERELL	.25
96. Fishes from Irkutsk, Siberia. JORDAN and THOMPSON	.30	136. Skeleton of Platigonus Leptorhinus. PETER- SON	.10
97. South American Tetrigidae. BRUNER	1.00	137. Lichens Collected in the Thunder Bay District, Ontario. R. HEBER HOWE, JR.	.10
98. Fauna of the Allegheny and Conemaugh Series in Western Pa. RAYMOND	.30		

138. Preliminary List of Fossil Plants in the Roof of the Pittsburgh Coal. GRIER	.10	179. Mammals of the Isle of Pines. HOLLAND	.05
139. Undescribed Remains of the Uinta Titanotheres Dolichorhinus. PETERSON	.15	180. Report upon Fossil Material Collected in Cave in the Isle of Pines. PETERSON	.10
140. Triassic Fishes Belonging to the Catopteridae and Semionotidae. EASTMAN	.15	181. New Species of Fern (<i>Polystichum jenningsi</i>). HOPKINS	.10
141. Osteology of <i>Promerycochoerus</i> . PETERSON ...	.40	182. Notes upon the Genus <i>Leucophenga</i> Mlk, with Descriptions of New Species. KAHL	.30
142. Correction of a Generic Name. PETERSON	.05	183. Some Species of <i>Rhamdia</i> , a Genus of S. American Siluridae. EIGENMANN & FISHER ..	.15
143. Skull of <i>Bison Crassicornis</i> . HOLLAND	.10	184. New and Rare Species of South American Siluridae. EIGENMANN	.30
144. <i>Serrasalmia</i> and <i>Myliina</i> . EIGENMANN	.50	185. List of the Hypophthalmidae, Diplomystidae, and some Unrecorded Species of Siluridae. FISHER ..	.30
145. Heads and Tails: Notes on Sauropod Dinosaurs. HOLLAND	.15	186. A Synopsis of the Saurian Genus <i>Prionodactylus</i> . GRIFFIN	.05
146. Dipterous Remains from Upper Devonian of Colorado. EASTMAN	.10	187. Notes on a Collection of Fishes from Ceylon with Descriptions of New Species. JORDAN & STARKS	.35
147. Notes on Tropical American Tettigonoidea (Locustodea). BRUNER	1.65	188. Collection of Fishes from Port Said, Egypt. JORDAN & HUBBS	.20
148. New Species of Tortoise from Jurassic of Utah. GILMORE	.15	189. A Fossil-bearing Alluvial Deposit in Saltville Valley, Virginia. PETERSON	.10
149. <i>Fauna</i> of Upper Devonian in Montana. HAYNES	.45	190. Catalog of Collection of Watches belonging to H. J. Heinz. STEWART, HOLLAND, COGGESHALL	.50
150. New <i>Sphagebranchus</i> from Bahamas. EIGENMANN	.07	191. Contributions to the Natural History of the Isle of Pines: Reprinted from <i>Annals</i> , Vols. VIII-XI, 530 pp., 34 plates, index. Bound in cloth	5.00
151. Marine Fishes from Colombia and Ecuador. WILSON	.15	192. Material Discovered in the Upper Eocene of the Uinta Basin by Earl Douglass and O. A. Peterson. PETERSON	2.25
152. <i>Apareiodon</i> , a New Genus of Characid Fishes. EIGENMANN	.18	193. The Fresh-Water Fishes of the Island of Formosa. MASAMITSU OSHIMA	2.75
153. New and Rare Fishes from S. American Rivers. EIGENMANN	.25	194. On <i>Elephenor</i> , a New Genus of Fishes from Japan. DAVID STARR JORDAN	.50
154. Three New Species of Characid Fishes. EIGENMANN & HENN	.12	195. A Description of <i>Cypripedium passerinum</i> . JENNINGS	.10
155. The Species of <i>Salminus</i> . EIGENMANN	.7	196. Obituaries of Charles Rochester Eastman, Andrew Arnold Lambing, Herbert Huntington Smith, and Henry John Heinz	each .10
156. South American Poecilid Fishes. HENN	.40	197. Saltatorial Orthoptera from S. America and Isle of Pines. BRUNER	1.00
157. A New Species of <i>Apatosaurus</i> . HOLLAND	.7	198. Orthoptera from Africa. BRUNER	.65
158. Birds of the Isle of Pines. TODD	.70	199. <i>Diplomystus goodii</i> Eastman. HOLLAND	.10
159. Reptiles and Amphibians of the Isle of Pines. BARBOUR	.20	200. Mussel Shells in Lake Erie, compared with those of Upper Ohio. GRIER	.50
160. Land and Fresh Water Shells of the Isle of Pines. HENDERSON	.20	201. Geology of Northeastern Brazil, and Fossil Mammalia. WARING & HOLLAND	.75
161. Pelecypoda of the Chazy. RAYMOND	.45	202. <i>Mugilidae</i> of Formosa. OSHIMA	.25
162. S. American Crickets, Gryllotalpoidea, and Achetoidae. BRUNER	1.30	203. <i>Contriscidae</i> of Formosa. OSHIMA	.10
163. Preliminary Catalog of N. American Sphaeriidae. STERKI	.75	204. <i>Chalcidoidea</i> in the Carnegie Museum. KAHL ..	.10
164. Directions for Collecting Sphaeriidae and Aquatic Gastropods. STERKI	.10	205. The Genus <i>Dicysta</i> Champion. DRAKE	.10
165. Lepidoptera of the Isle of Pines. HOLLAND	.50	206. Fossil Plants of the Dakota Formation. GRESS ..	.30
166. Odonata of the Isle of Pines. KAHL	.15	207. Sub-fossil Birds from Bermuda, including the "Cahow." SHUFELDT	.65
167. A Trip to Islands in Lake Erie. GOODRICH	.15	208. The "Vigilant" Fire-engine. HOLLAND	.15
168. Land-Shell of Islands at Western End of Lake Erie, etc. CLAPP	.20	209. Notes on Sphaeriidae, Descriptions of New Species. STERKI	.15
169. Orthoptera of the Isle of Pines. HOLLAND & KAHL	.15	210. The Genus <i>Lactuca</i> in Western Pennsylvania. JENNINGS	.20
170. Obituary Notes. G. A. Link, T. A. Mills, Boyd Crumrine, E. M. Bigelow. HOLLAND	.10	211. The Birds of the Santa Marta Region of Colombia. TODD & CARRIKER	6.50
171. Two New W. African <i>Rhopalocera</i> . HOLLAND ..	\$0.15		
172. Botany of the Isle of Pines. JENNINGS	2.00		
173. List of Hymenoptera of Isle of Pines. HOLLAND ..	.10		
174. Some Species of <i>Farlowella</i> . EIGENMANN	.30		
175. List of S. American Lizards. GRIFFIN	.35		
176. <i>Leptodeira albopusca</i> (Lacépède). GRIFFIN	.10		
177. List of Coleoptera collected on Isle of Pines. HOLLAND & SCHWARTZ	.15		
178. Rhynchota of the Isle of Pines. HEIDEMANN & OSBORN	.10		